

AAIPU# A10-01200



# AIR ACCIDENT INVESTIGATION AND PREVENTION UNIT CIVIL AVIATION DEPARTMENT

NASSAU, N. P., BAHAMAS

## AIRCRAFT ACCIDENT REPORT

LOSS OF CONTROL DUE TO FUEL STARVATION

PIPER PA-23-250

**N20373**

FREEPORT GRAND BAHAMA, BAHAMAS

AUGUST 23, 2010





**Bahamas Department of Civil Aviation  
Air Accident Investigation and Prevention Unit  
P. O. Box AP-59244  
Lynden Pindling International Airport  
Nassau N. P., Bahamas**

## **AIRCRAFT ACCIDENT REPORT**

**PIPER AZTEC PA 23-250  
N20373**

**LOSS OF CONTROL DUE TO  
FUEL STARVATION / FUEL EXHAUSTION  
FREEPORT, GRAND BAHAMA, BAHAMAS  
AUGUST 23, 2010**

**AAIPU# A10-01200  
Adopted SEPTEMBER 15, 2010**

Abstract: This report explains the circumstances surrounding the fuel starvation / fuel exhaustion and crash of N20373 a PA23-250 aircraft while the aircraft was enroute from Walkers Cay, Abaco, Bahamas to Freeport Int'l Airport, Freeport Grand Bahama, Bahamas. The safety issues discussed in this report include pilot training and operations without an authorized air taxi operator certificate.



## Bahamas Department of Civil Aviation Air Accident Investigation and Prevention Unit

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September 15, 2010

Captain 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 N20373, a Piper Aztec PA-25-250 aircraft, registered in the United States of America to Cambridge Air Inc, 103 Springer Bldg, 3411 Silverside Rd. Wilmington, Delaware 19810 United States of America. This accident occurred on August 23, 2010 at approximately 9:45am local (1345 UTC) time at approximately 23 nautical miles north of Grand Bahama, Bahamas.

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.

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Delvin R. Major  
Investigator in Charge  
Bahamas Department of Civil Aviation  
Air Accident Investigation and Prevention Unit



BAHAMAS CIVIL AVIATION DEPARTMENT  
AIR ACCIDENT INVESTIGATION AND PREVENTION UNIT

**TITLE**

**Operator:** Cambridge Air Inc, 103 Springer Bldg, 3411 Silverside Rd, Wilmington  
Delaware 19810 USA

**Manufacturer:** Piper

**Model:** PA 23-250

**Nationality:** United States of America

**Registration:** N20373

**Place of Accident:** Approximately 23 nautical miles north of Grand Bahama, Bahamas

**Date of Accident:** August 23, 2010

**SYNOPSIS**

**Notification:** DCA, NTSB, FAA, Piper Aircraft Inc., Lycoming Textron

**Investigating Authority:** Civil Aviation Department  
Air Accident Investigation and Prevention Unit

**Investigator in Charge:** Delvin R. Major

**Accredited Representative:** Mr. Darrell T. Webb – FAA

**Releasing Authority:** Civil Aviation Department

**Date of Report Publication:** September 15, 2010

## **ABBREVIATIONS and TERMINOLOGY**

*When the following terms are used in this report, they have the following meanings;*

AAIPU	Air Accident Investigation and Prevention Unit
ADDS	Aviation Digital Data Service - Report 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)
CFR	US Code of Federal Regulations
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
CAD	Civil Aviation Department
EST	Eastern Standard Time (-5 hours (-4DT) to convert from UTC)
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
MALSF	Medium-intensity Approach Lighting System (with sequenced flashers)
MET	Meteorological Office / Department
METAR	Weather Report furnished by Meteorological Department
MIRL	Medium Intensity Runway Lights
NDB	Non-directional Beacon
NM or nm	Nautical Miles
NOTAM	Notices to Airman
NTSB	National Transportation Safety Board
PAPI	Precision Approach Path Indicator
RCA	Root Cause Analysis
SEP	Survival and Emergency Procedures Training
T/L	Technical Log
US / USA	United States of America
VFR	Visual Flight Rules
VOR	(Very High Frequency) Omni-directional Range Station
VMC	Visual Meteorological Conditions
UTC / Z	Universal Coordinated Time / 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.

**Critical Engine.** The engine whose failure would most adversely affect the performance or handling qualities of an aircraft.

**"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.

**Journey Log.** A form signed by the PIC of each flight that records the aircraft’s registration, crew member names and duty assignments, the type of flight, and the date, place, and time of arrival and departure.

**NOTAM or NoTAM** is the quasi-acronym for a "Notice to Airmen". NOTAMs are created and transmitted by government agencies under guidelines specified by Annex 15: Aeronautical Information Services of the Convention on International Civil Aviation. A NOTAM is filed with an aviation authority to alert aircraft pilots of any hazards *en route* or at a specific location. The authority in turn provides a means of disseminating relevant NOTAMs to pilots.

**Operational Flight Plan.** The operator's plan for the safe conduct of the flight based on considerations of aircraft performance, other operating limitations, and relevant expected conditions on the route to be followed and at the aerodromes or heliports concerned.

**“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.

**Single Pilot Air Taxi.** An operator of non-turbojet aircraft having a maximum certificated configuration for nine or less passengers, that has no more than- (i) 1 aircraft; and (ii) 1 pilot-in-command.

**“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.

## BODY

### 1.0 FACTUAL INFORMATION:

#### 1.1 HISTORY OF THE FLIGHT

On Monday August 23, 2010 at approximately 09:45am (1345 UTC<sup>1</sup>) a fixed wing, twin-engine, Piper Aztec PA 23-250 aircraft, United States Registration N20373, crashed in waters approximately 8 - 10 feet and approximately 23 nautical miles north Grand Bahama, Bahamas. The coordinates initially reported of the aircraft crash site is 26°46'58"N and 78°31'06"W. The aircraft was submerged, extent of damage unknown. Aircraft inaccessible for further examination.

The unauthorized commercial charter flight departed Walkers Cay International Airport, Walkers Cay Abaco, Bahamas at approximately 9:30am (local). The destination was Freeport International Airport, Freeport, Grand Bahama, Bahamas. The flight was operated under Visual Flight Rules<sup>2</sup> (VFR) and proposed a flight time of 20 min. The aircraft planned and operated at an altitude of 4,500 feet<sup>3</sup>. The aircraft was fuelled with 30 gallons of Aviation Gasoline (Avgas) in Freeport on the evening of Sunday 22 August 2010.

The aircraft arrived in Walkers Cay on the morning of August 23 at approximately 9:00am. According to survivors and the pilot reports once all (5) of the passengers arrived the aircraft was loaded with passengers and luggage and then departed for Freeport.

According to the pilot's aircraft occurrence report, he "departed Walkers Cay enroute to Freeport and while cruising at 4,500 feet and while descending and approximately 29 nautical miles from Freeport, he noticed the left fuel gauge fluctuating up and down." The pilot reported that he "turn on the left fuel pump, the problem continued, he put the mixture rich, props forward and throttle forward, problem persisted. He then radioed Freeport Tower and reported the situation. The fuel pumps were then switched from the inboard to the outboard, both mixture, prop & throttle were pushed full forward and both pumps on. Tried feathering left prop but was unsuccessful. Approximately 23 nautical mile tower was informed again about the situation." Pilot statement further stated that he briefed the passengers and aircraft landed tail first in about 10 feet of water at low tide. Several passengers received minor injuries.

A passenger who sat in the front right seat of the aircraft next to the pilot stated that "we took off from Walkers Cay and the flight was going well until about 10 to 12 minutes into the flight, when I heard and felt the plane engine start to flutter and jerk. Fritz then told me that the left engine started to give him trouble and he showed me some instrument on the dash board and he radioed the control tower. He also told me the right engine is nothing to worry about because the left engine was working and that we could make it in on one engine."

According to the same passenger after he said that, "the plane felt like it sped up and I could hear the engine rev up. Fritz then told me that we going down and he again radioed the control tower." "I could see he was trying to control the airplane, *so I said to everyone to loosen their seat belt and I loosened mine*. Not long after that I felt when the plane hit the water on my side and the door that we entered the plane with completely broke off and water started come into the plane."

Another passenger who sat behind the pilot stated "about 20 minutes into the flight I felt this feeling like the plane first stopped in mid air so I look and I could hear the pilot talking but I later learnt that he was talking to the control tower. At this point I looked out the window and I could see that we were close to the water and the plane was experiencing a lot of turbulence. After that everything was happening really fast and the plane hit the water and I came up out of my seat and ended up hitting the dash board where all the plane instruments are."

In the pilot official report given to the authorities in Freeport, the pilot reported that about 26 miles out of Freeport Airport he noticed the fuel gauge indicator start fluctuating. He later reported that "he was experiencing engine problems because his fuel pump was giving him problems".

The pilot further stated that "after he started to lose altitude he prepared his passengers and himself for emergency landing on water. *The engines were first feathering at this point* and I brought the plane down with the tail hitting the water first then nose."

#### 1.2 INJURIES TO PERSONS

<i>Injuries</i>	<i>Crew</i>	<i>Passengers</i>	<i>Others</i>	<i>Total</i>
Fatal				
Serious				
Minor/None	<b>1</b>	<b>5</b>		<b>6</b>

### 1.3 DAMAGE TO AIRCRAFT

According to the pilot damage to the aircraft was minor. Extent of damage to the aircraft was not verified by the investigation team as the aircraft was inaccessible. Aircraft still remains submerged in waters where the accident occurred.



### 1.4 OTHER DAMAGE

No buildings or structure received any damages.

### 1.5 PERSONNEL INFORMATION

The aircraft was piloted by 46 yr old Mr. Fritzgerald Cambridge. Mr. Cambridge held a United States of America Commercial Pilot License with multi engine, single engine and instrument privileges which was issued on December 16 2008. Mr. Cambridge commercial pilot license was **not valid** at the time of the accident, *see additional information 1.17*.

Mr. Cambridge also held a United States of America second class medical certificate issued January 11, 2008. This medical certificate was also **not valid** or current for the operations that he conducted *see additional information 1.17*.

Mr. Cambridge's total flying experience is questionable. The medical certificate application in **January 2008** listed his total civilian flight times as **5,900 hours**. Mr. Cambridge listed his total time experience on the Aircraft Occurrence Report on **August 23, 2010** as approximately **4,000 hours**. There appears to be a difference of **1,900** unaccounted for. His flying experience on this type of aircraft is listed as approximately **2,000 hours** (*see experience in Additional Information 1.17*). The amount of hours flown by Mr. Cambridge in the last 24 hr, 7 days or the last 30 days prior to the accident is unknown. Mr.

Cambridge lists his approximate flight hours total in the last 90 days as approximately 30. FAA record indicates there have been no violations or prior FAA-recorded aviation accident history against Mr. Cambridge.

### 1.6 AIRCRAFT INFORMATION

Aircraft N20373 a US registered aircraft was manufactured by Piper Aircraft. The aircraft was a PA23-250 model. The twin engine aircraft was manufactured in 1975 with serial number 27-7305178 and was registered to Cambridge Air Inc, 103 Springer Bldg, 3411 Silverside Rd Wilmington Delaware 19810. The aircraft was fitted with two reciprocating engine, model numbers IO-540-C4B5 manufactured by Lycoming Textron. The aircraft was listed in the normal category, standard classification. **Airworthiness date of the aircraft was unknown based on latest report received from the Federal Aviation Aircraft Database.**

a) Review of the aircraft log books for N20373 revealed that the most recent Annual Inspection<sup>4</sup> / 100 hour inspection was completed on March 21, 2010 at Hobbs time 359.2 hours. The Annual Inspection was completed in accordance with Federal Aviation Regulations (FAR) FAR 43 app D. Up to March 21, 2010 total airframe time in service listed as 3,445.3 hours. The aircraft had accumulated 1,392.4 hours since major overhaul on both engines.

The aircraft was supposed to be maintained in accordance with Piper Aircraft Maintenance Schedule 100 hour and 50 hour inspection program. However, on the previous two required inspections, hours between inspections were exceeded.

1. A 100 hour / Annual inspection was conducted on July 20, 2008 at Airframe Total Time (ATT) **3,118.1** hours and Tach time 032.0.
2. The next 100 hour / Annual inspection was conducted on September 15, 2008 at ATT **3,162.5** and Tach Time 76.4 hours, a difference of 124.4 hours (which exceeds the maximum allowed 10% overrun between inspections).
3. The next 100 Hour / Annual inspection was conducted on March 17, 2009 at ATT **3,242.5** and Tach time 156.4 hours, and TSMO 1179.0 a difference of 80 hours.
4. A **50 hour** inspection was then conducted at Hobbs time 266.3 hours. 109.9 hours since the previous 100 hour annual inspection. **(Inspection should have been a 100 hour inspection instead of a 50 hour inspection)**

5. Another 100 hour / Annual inspection was not conducted until ATT **3,445.3** hours and Tach Time 359.2 a difference of 202.8 hours since required last 100 hour / Annual Inspection.

There was no degree of consistency or regularity with the way maintenance was being conducted. Required maintenance times were exceeded in violation of FAR 43 and Maintenance Schedule.

b) The aircraft was **operated commercially** on this occasion and on previous occasions as admitted to by the pilot without complying with the requirements of 14 CFR Section 91.147 and BASR Schedule 12 Subpart B Schedule 12.015.

It was not known if the mass and center of gravity were within prescribed limits. It is not known if all luggage and items onboard the aircraft at the time of the accident were recovered.

c) **30 gallons of 100 low lead (100LL)** Aviation Gasoline (Avgas) was loaded in the inboard fuel tanks (15 gallons per side) on 22 August, 2010 (one day before the accident) the amount of fuel in the aircraft prior to the addition of the 30 gallons is unknown. Also unknown by the pilot and the investigation team is the **amount of fuel, if any**, was in the outboard or wing tip fuel tanks.

## 1.7 METEOROLOGICAL INFORMATION

It was not known if the pilot received a complete weather forecast report prior to departure from Freeport International Airport.

The weather was reported as VFR upon his departure from Freeport with visibility as 10 nm, winds south south east (SSE) at 8 to 10 knots gusting to 14 knots with scattered clouds at 2,000 feet to 4,000 feet. However, on the return the weather had deteriorated and the pilot stated that he had to deviate for weather.

## 1.8 AIDS TO NAVIGATION

At the time of the accident the aircraft had available to it, Freeport VOR<sup>5</sup> on frequency 113.2 for its navigation. VOR equipment was reported as serviceable.

## 1.9 COMMUNICATIONS

Communication was established with Freeport Air Traffic Control approximately 29 nautical miles and

then again 23 nautical miles north of Grand Bahama, Bahamas.

## 1.10 AERODROME INFORMATION

Departure or arrival Aerodrome information not provided as the aircraft did not crash on an aerodrome. However, the nearest aerodrome to the crash site was Freeport Int'l Airport, IATA Designation FPO, ICAO Designation MYGF, Location Grand Bahama Island. Altitude 7 ft / 2m above mean sea level (MSL). Coordinates 26°33'31.27"N and 078°41'43.99"W. Runway 06/24 length 11,000 ft / 3,359m runway paved with asphalt.

## 1.11 FLIGHT RECORDERS

N20373 was not fitted with a flight recorder as none was required by regulations for this type of aircraft.

## 1.12 WRECKAGE AND IMPACT INFO

N20373 crashed in an area approximately 23 miles north of Grand Bahama, in approximately 8-10 feet of water.

The coordinates initially reported of the aircraft crash site is 26°46'58"N and 78°31'06"W.



The airplane appeared to be intact post impact. The exact extent of damage is unknown as the investigation team did not visit the site due to the inaccessibility of the site

## 1.13 MEDICAL AND PATHOLOGICAL

The pilot and several passengers sustained minor injuries; they were admitted to hospital and subsequently released.

## 1.14 FIRE

No pre or post impact fire was reported.

## 1.15 SURVIVAL ASPECTS

The aircraft crash was survivable because of the calm weather and the depth of water at the crash site at the time of the accident.

A report at the time of the crash was for low tides. Survivor's reports indicate that they got out the aircraft and were holding on for about an hour before the pilot dove into the aircraft and got life vests for them.

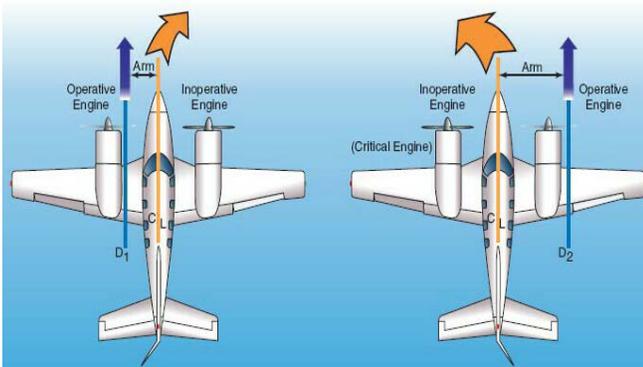
Rescue personnel report that upon arrival at the scene only three (3) persons were in possession of life vests. They stated that they provided the other three persons with life vests.



## 1.16 TESTS AND RESEARCH

### Critical Engine

When one of the engines on a typical multi-engine aircraft becomes inoperative, a thrust imbalance exists between the operative and inoperative sides of the aircraft. This thrust imbalance causes several negative effects in addition to the loss of one engine's thrust. For reasons listed below, the left engine of a conventional twin-engine propeller-driven aircraft is typically considered critical.



### Asymmetrical Yaw

When one engine becomes inoperative, a torque will be developed which depends on the lateral distance from the center of gravity (C.G.) to the thrust vector of the operating engine multiplied by the thrust of the operating engine.

The torque effect attempts to yaw the aircraft's nose towards the inoperative engine, a yaw tendency which must be counteracted by the pilot's use of the flight controls.

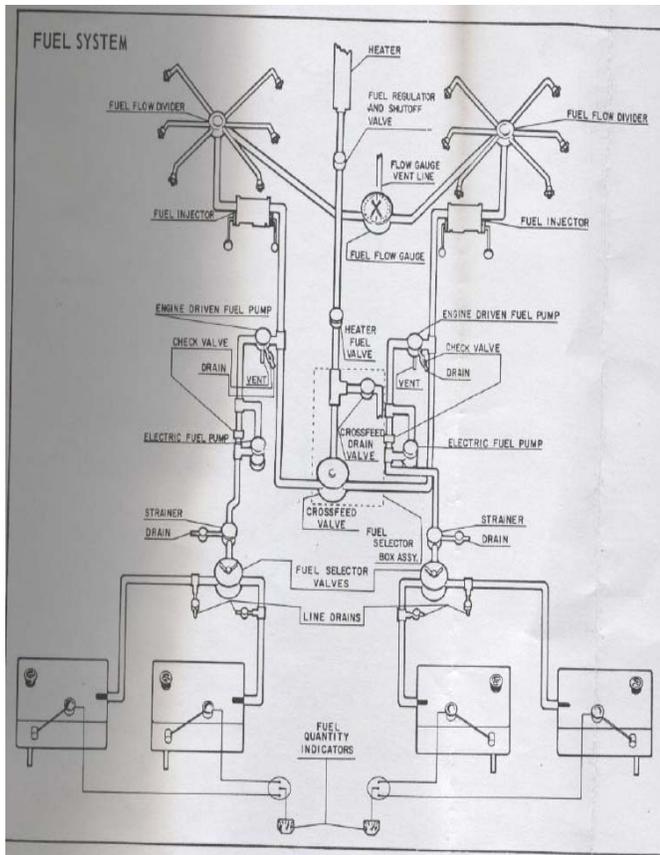
Due to P-factor, the right-hand engine typically develops its resultant thrust vector at a greater lateral distance from the aircraft's C.G. than the left-hand engine. The failure of the left-hand engine will result in a larger yaw effect via the operating right-hand engine, rather than vice-versa.

Since the operating right-hand engine produces a stronger yaw moment, the pilot will need to use larger control deflections in order to maintain aircraft control. Thus, the failure of the left-hand engine is less desirable than failure of the right-hand engine, and the left-hand engine is critical.

It is important to note, however, that this example depends upon both propellers turning clockwise as viewed from the rear. On aircraft with counterclockwise-turning engines (such as the de Havilland Dove), the right engine would be critical.

## Aircraft Fuel System

Following is a schematic of the fuel system and description and emergency procedures of the PA 23-250 aircraft copied from the pilot operating handbook for the PA 23-250.



Based on the diagram, failure of the engine driven fuel pump on the left engine should not cause a complete failure of the left engine. The timely actions of the pilot could have prevented the failure had it been the fuel pump that failed.

The options available to the pilot was to turn on the electric fuel pump and should that not work, as a last resort, cross feed from the fuel tanks on the right side.

The cross feed procedure was not done by the pilot according to his admission during the interview. He stated that he turned on the electric pump and still the engine failed.

According to the Mr. Cambridge, his engine failure was as a result of failure of the electric pump. See information on the fuel system which follows.

## FUEL SYSTEM

Four thirty-six gallon flexible fuel cells located outboard of the engines provide fuel storage in the Aztec. The cells should be kept full of fuel during storage of the airplane to prevent accumulation of moisture, and to prevent deterioration of the cells. For storage of more than ten days without fuel, the cells should be coated with light engine oil to keep from drying out.

The fuel system in the Aztec is simple, but completely effective. Fuel can be pumped from any tank to both engines, through use of the engine-driven and electric fuel pumps.

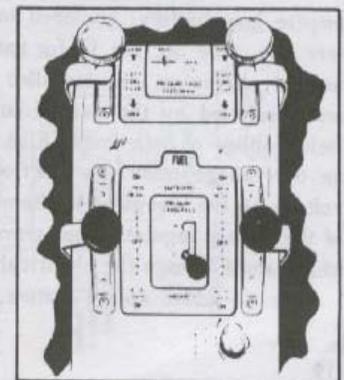
For normal operation, fuel is pumped by the engine-driven pumps from the tanks directly to the adjacent fuel injector. The fuel valves can be left on at all times and the crossfeed left in

the off position. Electric auxiliary fuel pumps, located in the engine nacelles, are installed in by-pass fuel lines between the tanks and the engine-driven pumps. The electric pumps can be used to provide pressure in the event of failure of the engine-driven pumps. They are normally turned on to check their operation before starting the engines, turned off after starting, to check engine-driven pumps and left on during take-off and landing, to preclude the possibility of fuel pressure loss due to pump failure at critical times.

If one of the engine-driven pumps fails, the electric pump to that engine can be turned on to supply the fuel. However, if desired, the fuel can be pumped by the operating engine-driven pump to the failed pump engine simply by turning on the crossfeed. The good pump will then be supplying both engines from its tank. If this tank runs low on fuel, fuel can be drawn from the opposite tank by turning on the electric pump on the failed pump side, leaving the crossfeed on, and turning the fuel valve on the empty side off. Then the electric pump on the failed pump side will be supplying both engines from its tank.

Fuel can thus be used from one tank or the other, by shutting off one main valve and turning on the crossfeed, to balance fuel loads or for other purposes. For all normal operation, it is recommended that fuel be pumped directly from the tanks to their respective engines, with the crossfeed off.

The fuel valve controls and crossfeed control are located in the fuel control panel between the front seats. Two electric fuel gauges in the engine gauge cluster on the instrument panel indicate the fuel quantity in each tank. The electric fuel gauges indicate the fuel quantity in the tank selected by the fuel selector handle, located in



Fuel Selector

the fuel control box. The electric fuel pump switches are on the lower left side sub-panel.

A crossfeed line drain valve control is mounted on the front face of the fuel control panel box. This valve should be opened occasionally, with the crossfeed on, the left electric fuel pump on, and then the right electric fuel pump on to allow any water that might accumulate at that point to be drained out. The heater fuel control is also placed on the fuel control panel, so that fuel to the heater can be turned off if necessary.

The fuel strainers and fuel line drain valves are located in the inboard sides of the main wheel wells. They are fitted with quick drains and should be drained regularly through their small access ports. In order to check the fuel system for possible moisture content, each fuel cell quick drain valve should be opened and drained and the quick drain valve on the fuel strainer should be opened and drained. This procedure should be accomplished at the three quick drain valves located in each main wheel well. Fuel screens are provided at the tank outlets, in the injectors and in the fuel filter bowls.

Idle cut-offs are incorporated in the injectors and should always be used to stop the engines. This is accomplished by pulling the mixture control levers to the rearmost position.

According to Mr. Cambridge the engine failure occurred during cruise flight, below is a description of emergency failure during cruise procedures.

#### EMERGENCY PROCEDURES

##### 1. Engine Failure:

An engine failure on the Aztec during cruising flight presents very minor operational problems. As the engine loses power, a slight yaw in the direction of the dead engine will occur, which can be corrected easily with the rudder or the rudder trim tab. While the plane is slowing down to the single engine cruising speed of about 138 MPH at low altitudes and at

moderate power settings, the propeller on the dead engine should be feathered by pulling the throttle to idling position and the prop pitch control back fully; then the mixture should be set at idle cut-off and the ignition off. Best single engine performance will be obtained with the dead engine wing held up about 3 degrees higher than level to help counteract the tendency to turn in that direction.

Based on the above information contained in the Pilot's Operating Handbook, the failure of an engine during cruise flight presents very minor operational problems. This further confirms that the pilot's lack of knowledge and failure to act adequately contributed to this accident.

Additionally, the lack of fuel in the aircraft tank would definitely create the situation the pilot found himself in. Having turned on the electric fuel pump, like the pilot claims, should have prevented the engine from failing.

Mr. Cambridge stated that the engine would not feather. He also stated that he advanced power levers, propeller levers and fuel mixture levers. In this configuration the propeller would not feather. In order to feather the propeller the power, propeller and fuel mixture levers needed to be brought back to the aft detent not fully forward as stated by Mr. Cambridge.

As stated below, despite the propeller not feathering, single engine flight was still possible, however with a decrease in single engine performance.

##### 2. Feathering:

The Hartzell feathering propellers can only be feathered while the failed engine is rotating, and not if the engine drops below 1000 RPM. The loss of centrifugal force due to slow RPM will activate a stop pin that keeps the propeller from feathering each time the engine is shut down on the ground. If an engine freezes up, it will be impossible to feather its propeller. Single engine flight can be maintained with the dead engine propeller unfeathered, although a noticeable decrease in single engine performance will take place.

#### 1.17 ADDITIONAL INFORMATION

According to written statements by Mr. Cambridge to Police at CDU in Grand Bahama and interview with Air Accident Investigators from the Air Accident Investigation and Prevention Unit of the Bahamas Civil Aviation Department in Nassau Bahamas, Mr. Cambridge confirmed that the flight which he conducted was indeed a commercial flight for which he was hired and paid.

Based on this admission Mr. Cambridge was required to comply with the requirements for operation of aircraft in commercial air transport for which he clearly was not in compliance.

***"I was hired by Mrs. Jennifer Bullard to take her and her family to Walkers Cay Airport....."***

***"I was paid \$350.00 for their transportation....."***

*Excerpt from police report given by Mr. Fitzgerald Cambridge, taken by CDU officers at the Grand Bahama Police Department.*

***"On Monday 16 August 2010 at about 10:00am I contacted Fritz Cambridge a private charter pilot that I knew of to take me and my kids and a number of my other friends and family over to Walkers Cay in order to attend my brothers funeral in Grand Cay Abaco."***

***"As result he told me that our flight would cost \$350.00 he had said that it would normally be \$400.00"***

*for a charter flight, but since we were being dropped off and picked up by him it would be \$350.00 each way."*)

*Excerpt from police report given by Mrs. Jennifer Bullard (survivor) taken by CDU officers at the Grand Bahama Police Department.*

*("I contacted Jennifer (Bullard) and I asked her about the flight and if I could go with her. She told me I could go with her, that the flight would be 9:00am on Monday and that I would have to pay \$70.00.")*

*Excerpt from police report given by Ms. Latanya Miller (survivor), taken by CDU officers at the Grand Bahama Police Department.*

As a person conducting commercial air transport operations Mr. Fitzgerald was required to comply with Medical, Airmen and Air Operator Certificate certifications and minimum fuel requirements (operation of aircraft). Details follow of what actually occurred.

As this aircraft was United States registered and pilot United States certified and the aircraft was operated in the Commonwealth of the Bahamas, Bahamas Civil Aviation (Safety) Regulations and United States Code of Federal Regulations 14 (CFR) Section 61 and 91 were required to be observed for commercial operations.

## **MEDICAL CERTIFICATION**

All certified pilots, with the exception of those with a sport pilot certificate (or when in command of balloons or gliders), **are required to maintain a medical certification commensurate with the privileges they intend to exercise as pilot-in-command of an aircraft.**

### **Bahamas Civil Aviation (Safety) Regulations Schedule 10.075 LICENCES REQUIRED**

**(a) No person may act as PIC or in any other capacity as a required flight crew member of a civil aircraft of:**

(1) Bahamian registry, unless he or she carries in their personal possession the appropriate and current licence for that flight crew position for that type of aircraft and a valid medical certificate.

(2) Foreign registry, unless he or she carries in their personal possession a **valid and current licence** for

that type of aircraft issued to them by the State in which the aircraft is registered.

## **MEDICAL CERTIFICATE REQUIREMENTS**

### **Bahamas Civil Aviation (Safety) Regulations (2001) 10.080 MEDICAL CERTIFICATES REQUIRED**

(a) No person may serve as an airman not may any person use an airman unless that person has in their personal possession a **valid airman medical certificate.**

(b) The medical certificate is valid for

**(2) 12 calendar months – for operations requiring a commercial pilot or flight engineer privileges;**

### **Bahamas Civil Aviation (Safety) Regulations (2001) Schedule 8.675**

#### **Medical Certification Requirements**

(a) To conduct the following operations, a person shall—

**(2) Hold at least a Class 2 medical certificate when exercising the privileges of a commercial pilot license;**

Mr. Fitzgerald Cambridge age 46 was issued a second class medical by the FAA on January 11 2008 which allowed him to conduct commercial operations.

#### **Schedule 8.680**

#### **DURATION OF A MEDICAL CERTIFICATE**

(b) A Class 2 medical certificate expires at the end of the last day of—

**(1) The 12th month after the month of the date of examination shown on the certificate for operations requiring a commercial pilot license or an air traffic controller license;**

For commercial operations Mr. Cambridge second class medical certificate expired on January 31, 2009.

If Mr. Cambridge had decided to use the second class medical certificate to exercise third class privileges it would have expired on January 31, 2010 as a third class medical expires 24 calendar months after issuance for pilots over age 40. However, he would not be allowed to offer services for compensation or hire.

However up to the time of this accident Mr. Cambridge had not renewed his medical certificate issued on January 11 2008 and therefore operated without a valid airman license.

## 14 Codes of Federal Regulations (CFR)

### Part 61 Certification

#### 61.23 MEDICAL CERTIFICATION

Medical certificates: Requirement and duration.

(a) Operations requiring a medical certificate, a person:

(2) Must hold at least a second-class medical certificate when exercising the privileges of a commercial pilot certificate;

A second class medical certificate is valid for the remainder of the month of issue; plus

- o 12 calendar months for operations requiring a second class medical certificate, or
- o 24 calendar months for operations requiring a third class medical certificate, if the airman is age 40 or over on or before the date of the examination.

#### AIRMEN CERTIFICATION

Pilot certificates other than student pilot certificates do not expire, although they may be suspended or revoked by the FAA. However, a pilot **must maintain currency** — recent flight experience that is relevant to the flight being undertaken.

To remain current, every pilot has to undergo a **flight review** with an instructor **every 24 calendar months** unless he gains a new pilot certificate or rating in that time or satisfies the flight review requirement using an alternate approved means.

For most types of certificate, he **must also undergo a medical examination** at intervals ranging from **six months to five years**, depending on **the pilot's age and desired flight privileges**. Other currency requirements apply to the carriage of passengers or to flight under instrument flight rules (IFR).

As Mr. Cambridge was engaging in commercial air transport he was required to comply with the following requirements of BASR 2001 for pilot training.

#### SUBPART A: GENERAL

##### 14.001 APPLICABILITY

(a) This Schedule prescribes the minimum requirements for qualification and currency of operations personnel to be able to serve in commercial air transport or to be used by the holder of an Air Operator Certificate issued by The Bahamas.

#### SUBPART E: PROFICIENCY AND COMPETENCY CHECKS

##### 14.120 PILOT AIRCRAFT AND INSTRUMENT PROFICIENCY CHECKS

(a) No pilot may serve nor may any person use a pilot flight crew member unless, since the beginning of the 12th calendar month before that service, that person has passed the proficiency check prescribed by the Authority for the make and model and, if applicable, type aircraft on which their services are required.

#### SUBPART H: RECURRENT TRAINING

##### 14.180 RECURRENT TRAINING: FLIGHT CREW MEMBERS

(a) No person may serve nor may any person use a person as a flight crew member unless within the preceding 12 calendar months that person has completed the recurrent ground and flight training curricula approved by the Authority.

#### AIR OPERATOR CERTIFICATE CERTIFICATION

Mr. Cambridge operated commercial air transport operations in violation of BASR Schedule 12 and 14 CFR Part 91 as outlined below.

#### BASR SCHEDULE 12, SUBPART B -

Schedule 12.015

Compliance with an Air Operator Certificate

(a) No operator may operate an aircraft in commercial air transport unless that operator holds an AOC for the operations being conducted.

#### SUBPART G: AIRCRAFT

##### Schedule 12.300 AUTHORISED AIRCRAFT

(b) No person may operate any specific type of aircraft in commercial air transport until it has completed satisfactory initial certification, which includes the issuance of an AOC amendment listing that type of aircraft.

**UNITED STATES OF AMERICA 14 CODE OF  
FEDERAL REGULATIONS (CFR) PART 91.147**

**GENERAL OPERATING AND FLIGHT RULES**

**Subpart B--Flight Rules**

Sec. 91.147 Passenger carrying flights for compensation or hire.

Each Operator conducting passenger-carrying flights for compensation or hire must meet the following requirements unless all flights are conducted under Sec.91.146.

(a) For the purposes of this section and for drug and alcohol testing, Operator means any person conducting nonstop passenger-carrying flights in an airplane or helicopter for compensation or hire in accordance with Sec. Sec. 119.1(e) (2), 135.1(a) (5), or 121.1(d), of this chapter that begin and end at the same airport and are conducted within a 25-statute mile radius of that airport.

(b) An Operator must comply with the safety provisions of part 136, subpart A of this chapter, and apply for and receive a Letter of Authorization from the Flight Standards District Office nearest to its principal place of business by September 11, 2007.

**FUEL REQUIREMENTS**

Based on interview with the pilot the Air Accident Investigation and Prevention Unit concludes that the pilot did not comply with the fuel requirements of both BASR 10.415, 10.420 and 14 CFR Part 91.151. See below and Part 3, Conclusions.

**BASR SUBPART G: FLIGHT PLANNING AND PREPARATION**

**10.415 FUEL, OIL, AND OXYGEN PLANNING AND CONTINGENCY FACTORS**

(a) No person may commence a flight unless he or she takes into account the fuel, oil, and oxygen needed to ensure the safe completion of the flight, including any reserves to be carried for contingencies.

**10.420 MINIMUM FUEL SUPPLY FOR VFR FLIGHTS**

(a) No person may commence a flight in an aeroplane under VFR unless, considering the wind and forecast weather conditions, there is enough fuel to fly to the first point of intended landing and, assuming normal cruising speed for at least 45 minutes thereafter.

**4 Code of Federal Regulations (CFR) Part 91.151  
*Fuel requirements for flight in VFR conditions.***

(a) No person may begin a flight in an airplane under VFR conditions unless (considering wind and forecast weather conditions) there is enough fuel to fly to the first point of intended landing and, assuming normal cruising speed—

(1) During the day, to fly after that for at least 30 minutes

The Investigation Team has also listed in 5.0 Appendix other provisions of the Bahamas Civil Aviation (Safety) Regulations that were not adhered to while commercial air transportation were being conducted by Mr. Cambridge.

Mr. Cambridge has also admitted that numerous previous flights conducted were also commercial air transportation flights. See excerpt of interview conducted by Investigators. For the month of August 2010 starting with August 02 a total of 34 flights were conducted by Mr. Cambridge in commercial Air transport.

<sup>1</sup> The 24 hour clock is used to describe the time of day, Coordinated Universal Time (UTC) as particular events occurred.

<sup>2</sup> Visual Flight Rules - are a set of regulations which allow a pilot to operate an aircraft in weather conditions generally clear enough to allow the pilot to see where the aircraft is going.

<sup>3</sup> Control tower strip confirmed aircraft level at altitude 4,500 feet.

<sup>4</sup> Annual Inspection. Any reciprocating-engine powered or single-engine turbojet/turbo propeller powered small aircraft (12,500 pounds and under) flown for business or pleasure is required to be inspected at least annually by an FAA certificated A&P mechanic holding an Inspection Authorization (IA), by an FAA certificated repair station that is appropriately rated, or by the manufacturer of the aircraft. The aircraft may not be operated unless the annual inspection has been performed within the preceding 12 calendar months. A period of 12 calendar months extends from any day of a month to the last day of the same month the following year. However, an aircraft with the annual inspection overdue may be operated under a special flight permit issued by the FAA for the purpose of flying the aircraft to a location where the annual inspection can be performed.

<sup>5</sup> VOR, short for VHF Omni-directional Radio Range, is a type of radio navigation system for aircraft. A VOR ground station broadcasts a VHF radio composite signal including the station's identifier, voice (if equipped), and navigation signal. The identifier is Morse code. The voice signal is usually station name, in-flight recorded advisories, or live flight service broadcasts. The navigation signal allows the airborne receiving equipment to determine a magnetic bearing from the station to the aircraft (direction from the VOR station in relation to the Earth's magnetic North at the time of installation). VOR stations in areas of magnetic compass unreliability are oriented with respect to True North. This line of position is called the "radial" from the VOR. The "intersection" of two radials from different VOR stations on a chart provides an approximate position of the aircraft.

## 2.0 ANALYSIS

### 3.0 CONCLUSIONS

#### 3.1 FINDINGS

1. The pilot **was not** properly certified nor qualified for the flight.
2. The pilot airman license was not valid due to the failure to maintain currency and a medical for the type of operations (commercial) conducted.
3. The pilot was **not in possession** of a valid medical certificate as required by 14 CFR 61.23 and BASR Schedule 8.675.
4. The pilot conducted **unauthorized commercial** operations in violation of 14 CFR 91.147 and BASR 12.105
5. The airplane was properly certificated but **not adequately maintained** in accordance with existing regulations.
6. Failure of the pilot to effectively manage the loss of thrust following failure of the critical engine contributed greatly to this accident.
7. Engine securing (feathering) procedures were not followed correctly.
8. There was no evidence to support whether the pilot received a standard weather briefing prior to departure.
9. There was no evidence to support whether the pilot received an abbreviated or enroute weather briefing.
10. The aircraft was not insured for private or commercial operations.

#### 3.2 PROBABLE CAUSE

The investigation team has determined that the probable cause of this accident is **loss of control of the airplane due to failure of the critical engine (left)** from which the pilot was unable to effectively manage and subsequently crashed in the water.

The probable cause of the failure of the left (critical) engine is determined to be fuel exhaustion resulting in fuel starvation to the engine.

### 3.3 CONTRIBUTING FACTORS

- The pilot's poor judgment and poor decision making skills.
- The pilot's systems knowledge is questionable and greatly contributed to this accident. He added fuel to the aircraft yet did not know how much fuel was already on the aircraft. He then switches fuel tanks from a tank he knew he put fuel in to a tank where he had no idea if there was or how much fuel there was. After switching tanks the problem persisted this resulted in the complete failure of the left engine.
- Pilot failed to use all avenues available to him. He suspected a problem with the fuel on the left but never considered cross feeding the engine from the right side.
- As in the case of the engine failure, switching tanks, advancing controls, turning on fuel pumps and the problem persisting is indicative of fuel exhaustion which the pilot did not recognize and take appropriate action to fix.
- Pilot failed to adhere to fuel requirements of BASR Schedule 10 Subpart G Schedule 10.415 and 10.420 and 14 CFR 91.151

### 4.0 RECOMMENDATIONS:

As a result of this investigation the AAIPU makes the following recommendations;

The Civil Aviation should petition the government to;

1. Institute more strict penalties for violators that conduct unauthorized commercial charter flights. The civil penalties that are levied are inadequate and no deterrent from engaging in this unauthorized air transportation.
2. Make it mandatory that all aircraft flying in the Bahamas airspace be required to have insurance.
3. Streamline the process whereby violators of the BASR are prosecuted more efficiently than is the case at this time.
4. The Civil Aviation Department also needs to embark on a more aggressive awareness program for the public to address the issue of unauthorized air transport.

## **5.0 APPENDICES:**

### **BAHAMAS CIVIL AVIATION SAFETY REGULATIONS 2001 EXCERPTS;**

#### **BASR SCHEDULE 8**

#### **SUBPART D: MEDICAL STANDARDS AND CERTIFICATION**

##### *Section II: Medical Certification Procedures*

#### **8.670 ISSUANCE OF MEDICAL CERTIFICATE**

(a) The Authority will issue the applicable medical certificate to any person who meets the medical standards prescribed in this Subpart, based on medical examination and evaluation of the applicant's history and condition.

(b) Each person to be issued a medical certificate shall undergo a medical examination based on the physical and mental standards contained in this Subpart.

#### **Schedule 8.675 MEDICAL CERTIFICATE REQUIREMENTS**

(a) To conduct the following operations, a person shall—

(1) Hold a Class 1 medical certificate when exercising the privileges of an airline transport pilot license;

(2) Hold at least a Class 2 medical certificate when exercising the privileges of a commercial pilot license; or

(3) Hold at least a Class 3 medical certificate—

(i) When exercising the privileges of a student pilot license;

(ii) When exercising the privileges of a private pilot license;

#### **8.680 DURATION OF A MEDICAL CERTIFICATE**

(a) A Class 1 medical certificate expires at the end of the last day of—

(1) The sixth month after the month of the date of examination shown on the license for operations requiring an airline transport pilot license;

(2) The 12th month after the month of the date of examination shown on the license for operations requiring a commercial pilot license or an air traffic controller license; or

(3) As specified in paragraph (c) of this subsection for other licenses.

**(b)** A Class 2 medical certificate expires at the end of the last day of—

(1) The 12th month after the month of the date of examination shown on the certificate for operations requiring a commercial pilot license or an air traffic controller license; or

(2) The period specified in paragraph (c) of this subsection for other licenses.

**(c)** A Class 3 medical certificate for operations requiring a private pilot license, a flight instructor license (when acting as PIC or a required crewmember in operations other than glider or balloon), or a student pilot license expires at the end of—

(1) The 36th month after the month of the date of the examination shown on the certificate if the person has not reached his or her 40th birthday on or before the date of the examination; or

(2) The 24th month after the month of the date of the examination shown on the certificate if the person has reached his or her 40th birthday on or before the date of the examination.

#### **BASR SCHEDULE 10**

#### **SUBPART C: FLIGHT CREW REQUIREMENTS**

#### **10.065 FLIGHT CREW QUALIFICATIONS**

(a) The PIC shall ensure that the licenses of each flight crew member have been issued or rendered valid by the State of Registry, contain the proper ratings, and that all that the flight crew members have maintained recency of experience.

(b) No person may operate a civil aircraft in commercial air transport or aerial work unless that person is qualified for the specific operation and in the specific type of aircraft used.

#### **10.075 LICENCES REQUIRED**

(a) No person may act as PIC or in any other capacity as a required flight crew member of a civil aircraft of:

(1) Bahamian registry, unless he or she carries in their personal possession the appropriate and current licence for that flight crew position for that type of aircraft and a valid medical certificate.

(2) Foreign registry, unless he or she carries in their personal possession a valid and current licence for that type of aircraft issued to them by the State in which the aircraft is registered.

## **10.080 MEDICAL CERTIFICATE REQUIRED**

(a) No person may serve as an airman nor may any person use an airman unless that person has in their personal possession a valid airman medical certificate.

(b) The medical certificate is valid for

(1) 6 calendar months – for operations requiring airline transport pilot privileges;

*Note: It is permissible for the pilot of an air operator of another ICAO Contracting State when flying in the Bahamas to have a certificate valid for 12 months provided that they have not passed the age of 40.*

(2) 12 calendar months – for operations requiring a commercial pilot or flight engineer privileges;

(3) 24 calendar months – for operations requiring private privileges.

## **10.135 COMMERCIAL PILOT PRIVILEGES AND LIMITATIONS - GENERAL**

(a) A commercial pilot certificate may act as PIC of an aircraft for compensation or hire, including the carriage of persons or property for compensation or hire, provided the pilot is qualified in accordance with the Schedules applicable to the operation intended.

## **SUBPART G: FLIGHT PLANNING AND PREPARATION**

### **10.415 FUEL, OIL, AND OXYGEN PLANNING AND CONTINGENCY FACTORS**

(a) No person may commence a flight unless he or she takes into account the fuel, oil, and oxygen needed to ensure the safe completion of the flight, including any reserves to be carried for contingencies.

(b) Each person computing the required minimum fuel supply shall ensure that additional fuel, oil, and oxygen are carried to provide for the increased consumption that would result from any of the following contingencies—

(1) Expected winds or other meteorological conditions;

(2) Possible variations in ATC routings;

(3) Anticipated traffic delays;

(4) A complete instrument approach procedure and possible missed approach at destination;

(5) Loss of pressurization en route;

(6) Loss of one power-unit en route; and

(7) Any other conditions that may delay landing of the aircraft or increase fuel and oil consumption.

## **10.420 MINIMUM FUEL SUPPLY FOR VFR FLIGHTS**

(a) No person may commence a flight in an aeroplane under VFR unless, considering the wind and forecast weather conditions, there is enough fuel to fly to the first point of intended landing and, assuming normal cruising speed for at least 45 minutes thereafter.

## **10.430 AIRCRAFT LOADING, MASS AND BALANCE**

(a) No person may commence a flight unless all loads carried are properly distributed and safely secured, taking into consideration the effect of the mass on centre of gravity and floor loading limitations.

(b) No person may commence a flight unless the calculations for the mass of the aircraft and centre of gravity location indicate that the flight can be conducted safely and in accordance with the aircraft limitations, taking into account the flight conditions expected.

## **10.435 AIRCRAFT PERFORMANCE AND OPERATING LIMITATIONS**

(a) The detailed and comprehensive performance code of the State of Registry shall be the basis for any determination of aircraft performance.

(b) No person may commence a flight unless the calculations for the performance of the aircraft in all phases of flight indicate that the flight can be conducted safely and in accordance with the aircraft's designed performance limitations for any operation, taking into account the flight conditions expected.

## **BASR SCHEDULE 12,**

## **SUBPART B - AIR OPERATOR CERTIFICATE**

### **12.015 COMPLIANCE WITH AN AIR OPERATOR CERTIFICATE**

(a) No operator may operate an aircraft in commercial air transport unless that operator holds an AOC for the operations being conducted.

### **12.020 APPLICATION FOR AN AIR OPERATOR CERTIFICATE**

(a) An operator applying to the Authority for an AOC shall submit an application—

(1) In a form and manner prescribed by the Authority; and

(2) Containing any information the Authority requires the applicant to submit.

(b) Each applicant shall make the application for an initial issue of an AOC at least 90 days before the date of intended operation, except the Operations Manual and Maintenance Control Manual which may be submitted later than but not less than 60 days before the date of intended operation.

(c) An applicant who is requesting to be a Single Pilot Air Taxi shall make application at least 30 days prior to the date of intended operation.

## **SUBPART F: AOC HOLDER RECORDS**

### **Schedule 12.195 RECORD COMPLETION REQUIREMENTS**

(a) Each record required for AOC holder operations and maintenance purposes shall be completed in ink or indelible pen, unless otherwise approved by the Authority.

### **12.200 RETENTION AND MAINTENANCE OF PERSONNEL RECORDS**

(a) The AOC holder shall maintain current records which detail the qualifications and training of all its employees, and contract employees, involved in the operational control, flight operations, ground operations and maintenance of the air operator.

(b) The AOC holder shall maintain records for those employees performing crew member or operational control duties in sufficient detail to determine whether the employee meets the experience and qualification for duties in commercial air transport operations.

### **12.205 MAINTENANCE PERSONNEL QUALIFICATION AND CURRENCY RECORDS**

(a) The AOC holder shall have a record of the maintenance person's qualification and currency with respect to all Schedule requirements for these persons.

### **12.215 FLIGHT CREW QUALIFICATION AND CURRENCY RECORDS**

(a) The AOC holder shall have a record of the flight crew member's qualification and currency with

respect to all Schedule requirements for these crew members.

(b) Each flight crew member shall be provided a current summary record showing their completion of initial and recurrent qualification requirements.

### **12.225 CREW DUTY AND FLIGHT TIME RECORDS**

(a) The AOC holder shall have a record of the flight and cabin crewmembers' assigned and actual duty and flight time and minimum rest periods with respect to all Schedule 15 requirements for these crew members.

### **12.240 AIRCRAFT SERVICE AND MAINTENANCE RECORDS**

(a) The AOC holder shall have an aircraft technical log that contains the record of all servicing, defects, trend monitoring and maintenance tasks and tests on that aircraft during the course of its operations.

### **12.242 DEFERRED DEFECTS SUMMARY**

(a) The AOC holder shall have on each aircraft, a log of the deferred defects for that aircraft that is attached to or aligned with the Aircraft Technical Log.

### **12.250 LOAD AND PERFORMANCE PLANNING RECORDS**

(a) The AOC holder shall have an aircraft-specific load manifest to summarize the mass and balance and performance calculations for each flight in commercial air transport.

### **12.255 OPERATIONAL FLIGHT PLANNING RECORDS**

(a) The AOC holder shall have an operational flight planning document to record the planned route information, minimum fuel calculations, applicable weather conditions and notams and alternate airport selections for each flight in commercial air transport.

## **SUBPART G: AIRCRAFT**

### **12.300 AUTHORISED AIRCRAFT**

(b) No person may operate any specific type of aircraft in commercial air transport until it has completed satisfactory initial certification, which

includes the issuance of an AOC amendment listing that type of aircraft.

## **BASR SCHEDULE 14**

### **SUBPART A: GENERAL 14.001 APPLICABILITY**

(a) This Schedule prescribes the minimum requirements for qualification and currency of operations personnel to be able to serve in commercial air transport or to be used by the holder of an Air Operator Certificate issued by The Bahamas.

### **SUBPART E: PROFICIENCY AND COMPETENCY CHECKS**

#### **14.120 PILOT AIRCRAFT AND INSTRUMENT PROFICIENCY CHECKS**

(a) No pilot may serve nor may any person use a pilot flight crew member unless, since the beginning of the 12th calendar month before that service, that person has passed the proficiency check prescribed by the Authority for the make and model and, if applicable, type aircraft on which their services are required.

### **SUBPART H: RECURRENT TRAINING**

#### **14.180 RECURRENT TRAINING: FLIGHT CREW MEMBERS**

(a) No person may serve nor may any person use a person as a flight crew member unless within the preceding 12 calendar months that person has completed the recurrent ground and flight training curricula approved by the Authority.

## **14 CODE OF FEDERAL REGULATIONS (CFR)**

### **14 Code of Federal Regulations (CFR) Part 91.151**

#### ***Fuel requirements for flight in VFR conditions.***

(a) No person may begin a flight in an airplane under VFR conditions unless (considering wind and forecast weather conditions) there is enough fuel to fly to the first point of intended landing and, assuming normal cruising speed—

(1) During the day, to fly after that for at least 30 minutes; or

## **14 Code of Federal Regulations (CFR) Part 91.147**

### **GENERAL OPERATING AND FLIGHT RULES**

#### **Subpart B--Flight Rules**

**Sec. 91.147 Passenger carrying flights for compensation or hire.**

Each Operator conducting passenger-carrying flights for compensation or hire must meet the following requirements unless all flights are conducted under Sec.91.146.

(a) For the purposes of this section and for drug and alcohol testing, Operator means any person conducting nonstop passenger-carrying flights in an airplane or helicopter for compensation or hire in accordance with Sec. Sec. 119.1(e) (2), 135.1(a) (5), or 121.1(d), of this chapter that begin and end at the same airport and are conducted within a 25-statute mile radius of that airport.

(b) An Operator must comply with the safety provisions of part 136, subpart A of this chapter, and apply for and receive a Letter of Authorization from the Flight Standards District Office nearest to its principal place of business by September 11, 2007.

(c) Each application for a Letter of Authorization must include the following information:

- (1) Name of Operator, agent, and any d/b/a (doing-business-as) under which that Operator does business;
- (2) Principal business address and mailing address;
- (3) Principal place of business (if different from business address);
- (4) Name of person responsible for management of the business;
- (5) Name of person responsible for aircraft maintenance;
- (6) Type of aircraft, registration number(s), and make/model/series; and
- (7) An Antidrug and Alcohol Misuse Prevention Program registration.

[(d) The Operator must register and implement its drug and alcohol testing programs in accordance with part 120 of this chapter.]

(e) The Operator must comply with the provisions of the Letter of Authorization received.

## PILOT CERTIFICATION

Pilot certificates other than student pilot certificates do not expire, although they may be suspended or revoked by the FAA. However, a pilot **must maintain currency** — recent flight experience that is relevant to the flight being undertaken.

To remain current, every pilot has to undergo a **flight review** with an instructor **every 24 calendar months** unless he gains a new pilot certificate or rating in that time or satisfies the flight review requirement using an alternate approved means.

For most types of certificate, he **must also undergo a medical examination** at intervals ranging from **six months to five years**, depending on **the pilot's age** and **desired flight privileges**. Other currency requirements apply to the carriage of passengers or to flight under instrument flight rules (IFR).

All certified pilots, with the exception of those with a sport pilot certificate (or when in command of balloons or gliders), are required to maintain a medical certification commensurate with the privileges they intend to exercise as pilot-in-command of an aircraft.

### 14 Code of Federal Regulations (CFR) Part 61 Certification

#### 61.23 MEDICAL CERTIFICATION

Medical certificates: Requirement and duration.

(a) Operations requiring a medical certificate, a person:

(2) Must hold at least a second-class medical certificate when exercising the privileges of a commercial pilot certificate;

A second class medical certificate is valid for the remainder of the month of issue; plus

- 12 calendar months for operations requiring a second class medical certificate, or
- 24 calendar months for operations requiring a third class medical certificate, if the airman is age 40 or over on or before the date of the examination, or

(3) Must hold at least a third-class medical certificate-

- A third-class airman medical certificate is required to exercise the privileges of a private pilot certificate, recreational pilot certificate, a flight instructor certificate, or a student pilot certificate.

A third-class medical certificate is valid for the remainder of the month of issue; plus

- 24 calendar months for operations requiring a third class medical certificate, if the airman is age 40 or over on or before the date of the examination.