

AAIPU# A10-00034

# AIR ACCIDENT INVESTIGATION AND PREVENTION UNIT CIVIL AVIATION DEPARTMENT

NASSAU, N. P., BAHAMAS

## AIRCRAFT ACCIDENT REPORT

WEATHER ENCOUNTER AND CRASH

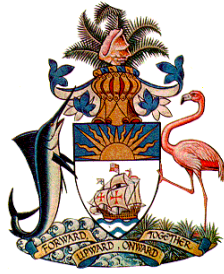
PIPER CHEROKEE SIX PA 32-300

**N4219R**

SOUTH BIMINI, BAHAMAS

JANUARY 17, 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**

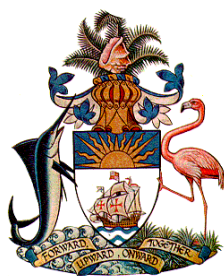
## **AIRCRAFT ACCIDENT REPORT**

**PIPER CHEROKEE SIX PA 32-300  
N4219R**

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SOUTH BIMINI, BAHAMAS  
JANUARY 17, 2010**

**AAIPU# A10-00034  
Adopted July 20, 2010**

**Abstract:** This report explains the circumstances surrounding the weather encounter and crash of N4219R a PA-32 aircraft while the aircraft was enroute from Lynden Pindling Int'l Airport Nassau, Bahamas to Ft Lauderdale Executive Airport, Ft Lauderdale, Florida, USA during a cold front and thunderstorm activity. The safety issues discussed in this report include pilot training in recognizing thunderstorm hazards and recovering from unusual attitudes and the relaying of complete weather information to pilots by air traffic controllers.



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

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July 20, 2010

Captain Patrick Rolle  
Director  
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Bahamas

Sir

The attached report summarizes the investigation into the circumstances of the accident involving N4219R, a Piper Cherokee Six PA-32-300, registered in the United States to DHPN Inc. This accident occurred on January 17, 2010 at approximately 4:40 local (2140 UTC) time at approximately 2 miles from South Bimini Airport, 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:** DHPN INC.  
**Manufacturer:** Piper Cherokee Six  
**Model:** PA32-300  
**Nationality:** United States  
**Registration:** N4219R  
**Place of Accident:** Approximately 2 miles Northwest of South Bimini Airport (MYBS)  
**Date of Accident:** January 17, 2010

**SYNOPSIS**

**Notification:** DCA, NTSB, ICAO, 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. Ron Maynard – Piper Aircraft Inc.  
Mr. Edward Rogalski – Lycoming Textron  
Mr. Jose Obregon – NTSB  
Mr. Darrell T. Webb – FAA  
Mr. Christopher Dannecker – GAB Robins  
**Releasing Authority:** Civil Aviation Department  
**Date of Report Publication:** March 31, 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)
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
NTSB	National Transportation Safety Board
PAPI	Precision Approach Path Indicator
RCA	Root Cause Analysis
SEP	Survival and Emergency Procedures Training
T/L	Technical Log
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.

**"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.

## BODY

### 1.0 FACTUAL INFORMATION:

#### 1.1 HISTORY OF THE FLIGHT

On Sunday January 17, 2009 at approximately 4:40pm (2140 UTC<sup>1</sup>) a fixed wing, single-engine, Piper Cherokee Six PA 32-300 aircraft, United States Registration N4219R, crashed in an area called the Bluff, in approximately 25 feet of water, approximately 500 yards north west of the Bimini Bay Resort, North Bimini, Bahamas. The coordinates of the aircraft crash site is 25°45'49.04"N and 79°16'59.85"W. The aircraft was destroyed.

The private flight departed Lynden Pindling International Airport (LPIA), Nassau, Bahamas at 1949 UTC (2:49PM). The destination was Ft Lauderdale, Executive Airport, Ft Lauderdale, Florida, United States of America (USA). The flight was operated under Visual Flight Rules<sup>2</sup> (VFR) and proposed a flight time of 1 hour and 30 min, Nassau, Bahamas direct to Ft Lauderdale Executive Airport, Ft Lauderdale, Florida. The aircraft planned and operated at an altitude of 4,500 feet<sup>3</sup>. The aircraft was fuelled with 37 gallons of Aviation Gasoline (Avgas) in Nassau and its fuel endurance was planned for 4 hours and 20 minutes. The flight plan form completed by the pilot listed three persons (all United States of America (US) citizens) on the aircraft. All occupants received fatal injuries<sup>4</sup>.

The aircraft was expected to arrive at Ft Lauderdale Executive Airport at 2119 UTC. At 2144 UTC Miami Center advised no cancellation of flight plan on the aircraft. An overdue aircraft alert was issued. At 2140 UTC Bahamas Air Sea Rescue Association (BASRA) requested information about an aircraft believed to have crashed in the Bimini area. At 2145 UTC Report from an eyewitness confirmed an aircraft had crashed in the area of South Bimini. At 2223 UTC the aircraft that crashed was confirmed to be N4219R.

The aircraft was piloted by Mr. David Alan Howell. Mr. Howell held a valid United States Private Pilot license. Mr. Howell also held a United States valid third class medical certificate issued April 04, 2008.

#### 1.2 INJURIES TO PERSONS

<i>Injuries</i>	<i>Crew</i>	<i>Passengers</i>	<i>Others</i>	<i>Total</i>
Fatal	1	2	0	3
Serious				
Minor/None				

#### 1.3 DAMAGE TO AIRCRAFT

The aircraft was destroyed during the impact sequence and subsequent water submersion. It was later recovered from the crash site and transported to Fort Pierce, Florida for further examination. See Appendix 5 for extent of airframe damage contained in report submitted by Mr. Ron Maynard, Air Safety Investigator of Piper Aircraft, Inc.

#### 1.4 OTHER DAMAGE

Other than damage sustained by aircraft, no other damage was reported.

#### 1.5 PERSONNEL INFORMATION

The aircraft was piloted by 45 yr old David Alan Howell of Naples, Florida, USA. Mr. Howell was the holder of a valid USA Private Pilot Certificate issued on May 17 2000 with Airplane Single Engine Land category and class rating with no limitations. Mr. Howell was also the holder of a valid USA third class medical certificate issued April 04 2008. Mr. Howell's medical certificate held no medical restrictions.

Mr. Howell's total flying experience recorded on his last medical certificate application in April 2008 listed his total civilian flight times as 386 hours. His flying experience including experience on this type of aircraft is unknown. The amount of hours flown by Mr. Howell in the last 24 hr, 7 days or the last 30 days prior to the accident is unknown. FAA record indicates there have been no violations or prior FAA-recorded aviation accident history against Mr. Howell.



Reports indicated that Mr. Howell flew the aircraft from Florida to the Bahamas with four (4) friends a few days prior to the accident. Two occupants (friends of the pilot) that arrived in Nassau on N4219R decided to stay a few days extra in Nassau. The other occupants decided to cut short their trip and leave early. They were unfortunately involved in the accident.

## 1.6 AIRCRAFT INFORMATION

Aircraft N4219R a US registered aircraft was manufactured by Piper Aircraft. The aircraft was a Pa-32-300 model. The single engine aircraft was manufactured in 1969 with serial number 32-40584 and was registered to a corporation. The aircraft was fitted with a reciprocating engine, model number TIO-540-SER manufactured by Lycoming Textron. The aircraft was listed in the normal category, standard classification. Airworthiness date of the aircraft was January 11 1969. The aircraft was registered to DHPN Inc, 161 Oakwood Dr, Naples, Florida.

a) Review of the aircraft log books revealed that the most recent Annual Inspection<sup>5</sup> / 100 hour inspection was completed on April 16, 2009. It was performed on N4219R by Primeplanes Aircraft Services Inc of Naples Florida. The Annual Inspection was completed in accordance with Federal Aviation Regulations (FAR) FAR 43 app D. As of August 28, 2009 the aircraft had accumulated 7,848 total hours of service.

The aircraft airframe was inspected, certified and by Mr. Craig Bloomer Airframe and Powerplant (A&P) licensed Mechanic with Inspection Authorization (IA) privileges. The inspection was signed off at tachometer time 1,435.3 hours and airframe total time of 7,797.8 hours.

The aircraft engine manufactured by Textron Lycoming, model number IO-540-KIA5, serial number L-9726-48 fitted to N4219R was also signed off as having undergone an annual inspection, also in accordance with FAR 43 app D on April 16, 2009. It was determined to be in an airworthy condition and signed by same mechanic at tachometer time 1,435.3 hours since overhaul. On August 28, 2009 at tachometer time 1,486 a subsequent inspection (oil change) was conducted on the engine. The airplane

engine had 306 total hours since its most recent major field overhaul at the time of this inspection.

The propeller affixed to the engine of N4219R, model HC-C2YK-1BF, serial number CH36136B was removed on October 15, 2008. It was overhauled and reinstalled on October 30 2008 by Sunstate Propeller Inc., Tampa, Florida at tachometer 1,380.5 hours. An annual inspection was completed at tachometer time 1435.3 hours since overhaul, by Primeplanes Aircraft Service on this propeller in accordance with FAR 43 app D. The propeller was determined to be in an airworthy condition on April 16 2009.

b) The aircraft was operated privately. 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) The aircraft uplifted 37 gallons of 100 low lead (100LL) Aviation Gasoline (Avgas) on 16 January, 2010 at 3:07pm (one day before the accident) by Executive Flight Support.

## 1.7 METEOROLOGICAL INFORMATION

Bahamas Meteorological Department Bahamas Area Forecast dated Monday 17 January, 2010 valid for 12 hours from 1800 UTC was reviewed.

Special Features section of the report indicated a cold front expected in the extreme northwest Bahamas slowly drifting eastwards over the Bahamas.

Significant Weather section of the report indicated, scattered<sup>6</sup> to broken<sup>7</sup> clouds 1,500 to 2,000 feet, scattered to broken clouds 4,000 to 5,000 merging with higher layers at 22,000 to 24,000 feet were forecasted. Isolated showers and thundershowers with tops (heights) well above 24,000 feet were expected. Cloud ceilings were forecasted to be below 1,500 feet and visibility below 3 nautical miles in heavy showers and thundershowers. Moderate to severe turbulence was reported in the vicinity of the towering cumulus<sup>8</sup> and cumulonimbus<sup>9</sup> clouds were expected. Residents of North Bimini indicated that, around the time of the accident, the weather in the area of Bimini and the crash site was "bad, with low visibility, dark and gray clouds and light to heavy showers in some area."

Forecasted Upper Winds and Temperature for the same time period from 1800 UTC showed at 5,000 feet in the Northwest Bahamas the winds were forecasted from a direction of 240 degrees and a speed of 33 knots. Temperature was forecasted at the 5,000 feet altitude at 15 degree Centigrade. The pilot planned and maintained an altitude of 4,500 feet (500 feet lower than the reported altitude winds and temperature). His flight path however put him in the area of the forecasted weather.

It was not known if the pilot received a weather report prior to departure from Lynden Pindling International Airport. It was also not known whether the pilot received any enroute weather report from Miami Center or Flight Service Station.

## **1.8 AIDS TO NAVIGATION**

At the time of the accident the aircraft had available to it, Nassau VOR<sup>10</sup> on frequency 112.7 for its departure and Bimini VORTAC<sup>11</sup> on frequency 116.7 for its enroute navigation prior to continuing with Miami Control Center. Both VOR and VORTAC equipment were reported as serviceable.

## **1.9 COMMUNICATIONS**

Communication was established with Nassau Air Traffic Control prior to and after departure from Nassau Area Control. Nassau ATC records show at 2217 UTC partial communication was established with aircraft, then communications ceased with Miami enroute center. There however, seem to be some inconsistencies with the time line of communications as ATC records showed partial communication with N4219R at 2217 UTC; however other reports indicate that at around 2140 UTC the possible crash of N4219R occurred.

The following is the summary excerpt of the ATIS<sup>12</sup> for 1900Z at Nassau Int'l Airport around the time of the departure of N4219R.

ATIS information Zulu (Z), Winds 190 degrees at 11 knots gusting to 21 knots. Visibility 8 nautical miles. Few clouds at 1,200 ft. Temperature 82°F / 28°C, dew point 75°F / 24°C. Altimeter setting was 30.00 inches Mercury. Visual approaches were being conducted to runways 09 and 14.

## **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 South Bimini. South Bimini, IATA Designation BIM, ICAO Designation MYBS, Location South Bimini, Bahamas. Altitude 10 ft / 3m above mean sea level (MSL). Coordinates latitude 25°41'59.57"N and longitude 079°15'52.76"W. Runway 09/27 length 5430 ft / 1655m Runway paved with asphalt.

## **1.11 FLIGHT RECORDERS**

N4219R was not fitted with a flight recorder as none was required by regulations for this type of aircraft.

## **1.12 WRECKAGE AND IMPACT INFO**

N4219R crashed in an area called the Bluff, in approximately 25 feet of water, approximately 500 yards northwest of the Bimini Bay Resort, North Bimini, Bahamas. The coordinates of the aircraft crash site is 25°45'49.04"N and 79°16'59.85"W. No distribution pattern of the wreckage could be determined due to the location and depth of the crash site and the underwater currents.

Except for the right outboard wing with aileron and wing tip attached, all other major components of the aircraft were recovered. More detail on the wreckage is included as Appendix 5.1 Piper Aircraft examination report. See also Appendix 5.2 Lycoming examination report.

## **1.13 MEDICAL AND PATHOLOGICAL**

Due to the force of the crash, human remains recovered were not intact or sufficient to conclusively and positively determine the identity of the occupants. Remains recovered were transported to the Princess Margaret Hospital Morgue. Up to the production of this Final report, results of the autopsy or toxicology to positively identify the occupants or reveal the cause of death were not available.

## 1.14 FIRE

Examination of the wreckage concluded no fire was involved pre or post crash.

## 1.15 SURVIVAL ASPECTS

The crash was witnessed by a security officer on duty at the time at the Bimini Bay Resort. Immediately after the aircraft crash the authorities were notified. A search was initiated immediately by BASRA and the US Coast Guard. Reports stated that recovery of the occupants was unable to be accomplished due to the lack of professional divers in the area at the time of the crash. The search was subsequently discontinued due to darkness.

Due to the impact forces human remains were not intact or readily identifiable. Remains were transported to the Princess Margaret Hospital Morgue Nassau, Bahamas for identification and cause of death via autopsy and toxicology. It could not be determined what seats were occupied by the occupants during the flight. Five (5) sets of seat belts were located. The rear seat belts were found still attached to the airframe. Portions of two other seat belt were still bolted to the airframe the other portions were found unattached in the wreckage.

## 1.16 TESTS AND RESEARCH

During the period January 20 to 22, an inspection and examination of the wreckage of N4219R was conducted at Ft Pierce International Airport

## 1.17 ADDITIONAL INFORMATION

No other pertinent information relevant at this time.

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

<sup>5</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

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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>6</sup> Scattered Clouds means occasional clouds

<sup>7</sup> Broken Clouds - clouds which cover between 6/10 and 9/10 of the sky

<sup>8</sup> Cumulus Clouds - A column of rising air that has condensed into a dense, non-fibrous cloud with distinct outlines, appearing much like a rising mound or dome. The base of the cloud is relatively flat and dark, while the tower is usually white and sunlit.

<sup>9</sup> Cumulonimbus Clouds - Cumulonimbus clouds (Cb) are much larger and more vertically developed than fair weather cumulus. They can exist as individual towers or form a line of towers called a squall line.

<sup>10</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.

<sup>11</sup> TACTical Air Navigation, commonly referred to by the acronym TACAN, is a navigation system used by military aircraft. It provides the user with bearing and distance (slant-range) to a ground or ship-borne station. It is a more accurate version of the VHF omnidirectional range/distance measuring equipment (VOR/DME) system that provides bearing and range information for military aviation. At VORTAC facilities where a VOR is combined with a TACAN, the DME portion of the TACAN system is available for civil use.

<sup>12</sup> **Automatic Terminal Information Service**, or **ATIS**, is a continuous broadcast of recorded *noncontrol* information in busier terminal (i.e. airport) areas. ATIS broadcasts contain essential information, such as weather information, which runways are active, available approaches, and any other information required by the pilots, such as important NOTAMS. Pilots usually listen to an available ATIS broadcast before contacting the local control unit, in order to reduce the controllers' workload and relieve frequency congestion.

The recording is updated when there is a significant change in the information, like a change in the active runway. It is given a letter designation (e.g. *bravo*), from the Phonetic Alphabet. The letter progresses down the alphabet with every update and starts at Alpha each day. When contacting the control tower or ground station, a pilot will indicate he/she has "information" and the ATIS identification letter to let the controller know that the pilot is up to date with all current information.

### **3.0 CONCLUSIONS**

#### **3.1 FINDINGS**

1. The pilot was properly certified and qualified for the flight.
2. The airplane was properly certificated and maintained in accordance with existing regulations.
3. There were no airplane system or power-plant anomalies that contributed to the cause of the accident.
4. There was no evidence to support whether the pilot received a standard weather briefing prior to departure.
5. There was no evidence to support whether the pilot received an abbreviated or enroute weather briefing.
6. The meteorological event that led to the accident was wide spread, as the cold front and thunderstorm activities approaching, were the cold front that had overnight affected the lower Florida area.
7. No evidence of any pre-impact mechanical failure or malfunction was found.

#### **3.2 PROBABLE CAUSE**

The investigation team has determined that the probable cause of this accident was the decision of the pilot to initiate and continue flight into clearly identified thunderstorm activity, resulting in a loss of control of the airplane from which the pilot was unable to recover and subsequent collision with the water.

This accident underscores the rapidly changing nature of thunderstorms, and the importance of clarifying information about the safety of flight near areas of convective activity.

#### **3.3 CONTRIBUTING FACTORS**

- The pilot's lack of proper training and certification to fly in weather less than that required for visual flight conditions contributed greatly to this accident.
- The pilot's failure to recover from an unusual flight attitude.
- The pilot's poor judgment and poor decision making skills.
- The pilot's failure to land at a nearby airport to wait out the approaching weather phenomenon to which he was not trained or certified to fly in.
- The pilot's failure to properly assess information concerning convective activity is a contributing factor. There should have been ample information available from visual observations and other resources for the pilot to make a decision to delay the trip or make a landing in South Bimini to wait the passage of the cold front and or thunderstorms prior to continuing the flight.
- There was an absence of prudence concerning thunderstorm and there was a demonstration of a lack of knowledge of thunderstorm activity evidenced by the activity of "scud running".
- The collective use and conservative interpretation of a proper weather briefing prior to departure or an enroute weather update would have been invaluable. This information would have provided evidence to the pilot of the maturation of a hazardous weather situation and the need for avoidance.
- Pilots must exercise conservative judgment when they are confronted with hazardous weather conditions, especially in the terminal environment.

They must be able to recognize and accurately interpret the conditions within, under or near rapidly developing and maturing thunderstorms. In addition, they must understand that the life cycle of a thunderstorm is extremely dynamic and can change significantly within a short distance or within a short time, or both. In particular they must recognize low altitude hazards associated with thunderstorms along or near their path and avoid them. More emphasis is needed in training to stress that the characteristics and dynamics of thunderstorms require deliberate avoidance techniques rather than the skills to fly through or under these thunderstorms.

#### 4.0 SAFETY RECOMMENDATIONS:

As a result of this investigation the AAIPU makes NO recommendations;

Final Report