



# Aviation Investigation Final Report

<b>Location:</b>	Fort Myers, Florida	<b>Incident Number:</b>	ERA09IA240
<b>Date &amp; Time:</b>	April 12, 2009, 14:05 Local	<b>Registration:</b>	N559DW
<b>Aircraft:</b>	Beech B200	<b>Aircraft Damage:</b>	None
<b>Defining Event:</b>	Miscellaneous/other	<b>Injuries:</b>	1 Fatal, 4 None
<b>Flight Conducted Under:</b>	Part 91: General aviation - Personal		

## Analysis

Shortly after takeoff during the incident flight, the pilot had an abnormal heart rhythm and was incapacitated. The passenger took control of the airplane and with assistance from several FAA air traffic control personnel, was provided information concerning operation of the airplane and was vectored to a nearby airport where he landed uneventfully. The pilot had a history, known to the FAA, of a previous heart attack and known coronary artery disease, treated with angioplasty and stent placement. He underwent comprehensive cardiovascular evaluation following this treatment, including a stress test with nuclear medicine imaging and a repeat cardiac catheterization. This testing revealed evidence of the previous heart attack, but no other areas of the heart with poor blood flow, and good heart function. On the basis of these studies, a Federal Aviation Administration (FAA) cardiology consultant indicated that the pilot was "qualified for Special Issuance Limited 2nd Class certification," and the pilot subsequently received an Authorization for such certification. The pilot was noted to have an abnormal heart rhythm during resuscitation efforts and died. The autopsy report noted coronary artery disease essentially identical to the pilot's cardiac catheterization findings, and there was no noted evidence of sudden clot formation. The autopsy report noted a thickening of the main heart chamber, which, in combination with the pilot's coronary artery disease, would have increased the risk for sudden cardiac death in this pilot. The cardiovascular testing performed on the pilot prior to his most recent medical certification did not reveal any evidence of this thickening.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this incident to be: The pilot's abnormal heart rhythm resulting in incapacitation.

## Findings

### Personnel issues

Cardiovascular - Pilot

## Factual Information

### History of Flight

#### Enroute-climb to cruise

Miscellaneous/other (Defining event)

On April 12, 2009, about 1405 eastern daylight time, a Beech B200, N559DW, registered to White Equipment Leasing LLC, was landed uneventfully by a pilot-rated passenger at Southwest Florida International Airport (RSW), Fort Myers, Florida, following cardiac incapacitation of the pilot shortly after takeoff from Marco Island Airport (MKY), Marco Island, Florida. Visual meteorological conditions (VMC) prevailed at the time and an instrument flight rules (IFR) flight plan was filed for the 14 Code of Federal Regulations (CFR) Part 91 personal flight from MKY to Jackson-Evers International Airport (JAN), Jackson, Mississippi. The airplane was not damaged and the certificated airline transport pilot was pronounced dead after arrival. The pilot-rated passenger and three additional passengers were not injured. The flight originated from MKY about 1315.

The airplane owner who is a certificated private pilot with airplane single engine land rating was in the co-pilot's seat for the incident flight. He stated that the incident pilot flew the incident airplane to MKY that day, and arrived there about 1245 to 1300. The pilot assisted with loading baggage and the owner stated he did not notice anything wrong with him. Additionally, the pilot did not mention about having any physical problems.

The owner also stated that approximately 5 to 8 minutes after takeoff while flying northbound and climbing, the pilot said, "OK, climb checklist," and using the checklist, verbalized each item and pointed to the respective instrument/switch. After completion, the pilot put the checklist away, and the flight continued on the northerly heading.

Safety Board review of a voice tape from Miami Air Route Traffic Control Center (Miami ARTCC) revealed the pilot established contact with the facility, and the controller cleared the flight to climb to 14,000 feet mean sea level (msl). The pilot did not respond to the clearance from the controller. Approximately 20 seconds later, the owner who was seated in the co-pilot's seat declared an emergency advising the controller of the pilot incapacitation and the need to speak with someone familiar with the B200 airplane.

The owner later stated that approximately 1 to 3 minutes after completion of the climb checklist, while flying between 5,000 and 6,000 feet msl, he noticed the pilot's head was down and both hands were at his sides. The owner attempted to get the pilot's attention but he made an audible sound which increased in intensity, and the pilot's right hand fell off his thigh. The pilot did not make any further sounds.

Further review of the voice tape from Miami ARTCC revealed the flight continued on a northerly

heading climbing to approximately 17,300 feet msl. Another Miami ARTCC controller talked the owner through the process of disengaging the autopilot, descending, and heading changes. Air traffic control communications were then transferred to Fort Myers Approach Control. Review of voice and radar data from Fort Myers Approach Control revealed the controller provided information to the owner regarding information concerning the landing gear, flaps, power levers, and airspeed settings. The flight was vectored for a 15 mile long final approach for runway 6 at RSW, and the airplane was landed uneventfully. The owner taxied onto a taxiway where the engines were secured and medical personnel were standing by.

Forensic toxicology was performed on specimens of the pilot by the FAA Bioaeronautical Sciences Research Laboratory (CAMI), Oklahoma City, Oklahoma, and also by Wuesthoff Reference Laboratory (Wuesthoff Laboratory), Melbourne, Florida. The toxicology report by CAMI indicated the results were negative for carbon monoxide, cyanide, and volatiles. The report detected an unspecified amount of Atropine in the blood specimen. The toxicology reports by Wuesthoff Laboratory was negative in the femoral blood specimen for the immunoassay screen and volatiles. Caffeine was detected in the femoral blood specimen. The results were negative in the immunoassay drug screen for the submitted urine specimen.

The NTSB Medical Officer reviewed the medical records maintained by the FAA Aerospace Medical Certification Division on the pilot. The following information was extracted from those records:

The pilot's most recent application for 3rd class Airman Medical Certificate, dated 11/20/2008, indicates "Yes" in response to "Do You Currently Use Any Medication," and notes clopidogrel, aspirin, amlodipine, and simvastatin. The application notes "Yes" to "Heart or vascular trouble" and to "High or low blood pressure." Under "Explanations" is noted, in part, "Stent in right coronary artery." Height is noted as 70 inches and weight as 217 pounds. Blood pressure is noted as 136/70.

A letter from the pilot's Aviation Medical Examiner dated 1/6/2009 notes, in part, that the pilot "... underwent his physical for class II FAA certificate on 11/20/2008. He had undergone a stent to the right coronary artery ... Initially he was found with a slight abnormality in his EKG and treadmill confirmed there was a lesion. This was confirmed by coronary angiogram, angioplasty, and stent. Postoperatively, he has done well. His medications are Zocor [simvastatin] 40 mg, Norvasc [amlodipine] 5 mg, Plavix [clopidogrel] 75 mg and aspirin 325 mg, all taken once a day. His blood pressures have been normal. He has no problems with any of the medications as far as any side effects. He has a negative treadmill and an essentially normal cath except for the stent that is in place and open. He never had any chest pain, shortness of breath, or fatigue from the coronary artery disease. He has no symptoms in regards to that at the present time. He is in excellent health ... "

Report of exercise stress test performed 9/24/2008 notes, in part, "The patient exercised on a treadmill for a total of 6.05 minutes, on a standard Bruce Protocol, reaching >100% of the maximum age predicted heart rate. The maximum blood pressure reached was 176/88. The

patient reached a peak heart rate of 166 bpm. ... The exercise portion of the test was non-diagnostic. The patient displayed good exertional capacity during stress. ... During rest and stress imaging, there was a small fixed photopenic defect in the lateral wall, suggestive of scar. On the gated portion of the study, wall motion is normal and showed no wall motion abnormality. Patient has an ejection fraction of 46%. T.I.D. [transient ischemic dilation] Index is 0.89. ... This study suggests scar in the distribution of the Circumflex. ...”

A report of cardiac catheterization performed 11/10/2008 notes, in part:

... Left main – Normal

Left anterior descending artery – Normal caliber vessel with diffuse luminal irregularities and tortuosity throughout its course. This vessel presents with a proximal 30% stenotic narrowing.

Left circumflex artery – Normal caliber vessel with diffuse luminal irregularities and tortuosity throughout its course. Very small distally, and has a mid total occlusion, filled distally by collaterals from the left anterior descending, unchanged from cardiac catheterization performed previously.

Right coronary artery – Large caliber vessel, dominant vessel, patent at the previous sites of stenting. Has a mid aneurysmal dilatation and diffuse luminal irregularities, but no significant high-grade stenosis. Dominant vessel.

Ejection fraction of 50% with preserved left ventricular systolic function. ...

An FAA cardiology consultant report dated 2/19/2009 notes, in part, that the pilot “...had a coronary episode in March of 2008 at which time he underwent cardiac catheterization and stent deployment in his right coronary artery. The right coronary artery has multiple plaques and total proximal stents, which are patent and the vessel distal to the stenting is patent. There is a fairly large coronary artery aneurysm in the mid-course of the right coronary artery. The vessel is patent both proximal and distal to the aneurysm. No evidence of ischemia either electrocardiographically or scintigraphically on the stress test. The basic electrocardiogram is suggestive of an old inferior myocardial infarction and this is confirmed scintigraphically by the fact that the basal portion of the left ventricle is not very contractile. On the basis of these findings, I think the airman is qualified for Special Issuance Limited 2nd Class certification and he should have the usual follow-up.”

An Authorization for Special Issuance of a Medical Certificate dated 2/23/2009 notes, in part, “... The medical evidence reveals a history of coronary heart disease that has required treatment (percutaneous transluminal coronary angioplasty with intracoronary stent placement), hypertension, and use of medication. You are ineligible for airman medical certification ... However, based on the complete review of the available medical evidence, I have determined that you may be granted Authorization for special issuance second-class medical certification ... This Authorization expires on November 30, 2009. Consideration for a new Authorization will be contingent upon receipt of the following ... Approximately 60 days prior to the expiration of this Authorization ... and at subsequent 12-month intervals, a report of a current cardiovascular evaluation and current laboratory data ... a report of a current maximal treadmill stress test. ... On or about October 1, 2010, and at subsequent 24-month intervals, a report of a current SPECT radionuclide myocardial perfusion study performed in

conjunction with a maximal treadmill stress test. ..."

The NTSB Medical Officer reviewed the report of autopsy performed on the pilot at the Office of the District 21 Medical Examiner in Fort Myers, Florida. The following information was extracted from that report:

"Cause of Death" is noted as "Hypertensive and Arteriosclerotic Cardiovascular Disease."

Under "Evidence of Medical Therapy" is noted, "An endotracheal tube is identified within the oral cavity and is properly situated. Defibrillator pads are identified on the left upper chest and left upper back. Underlying the left anterior chest defibrillator pad are multiple, dried, red-orange marks consistent with defibrillation. The left pretibial area has an intraosseous catheter."

Under "Internal Examination" is noted, in part:... The pericardial sac is intact and contains a normal amount of clear, yellow pericardial fluid. The enlarged, 460 gram heart has a smooth, glistening epicardial surface associated with an increased amount of subepicardial fat. The coronary arteries arise normally and distribute in a right dominant pattern. Identified within the right main coronary artery and proximal aspect of the right coronary artery is an appreciable stent which is submitted ... for analysis. The left anterior descending coronary artery has two, separate, appreciable atherosclerotic lesions, one in the proximal distribution and one in the mid-distribution of that vessel. The maximum estimated obstruction of atherosclerosis in the left anterior descending coronary artery is 50%. The left circumflex coronary artery is nearly occluded by atherosclerotic disease. The remaining coronary vessels have minimal appreciable atherosclerotic disease. The atria are mildly dilated bilaterally. Both ventricles are dilated. The left ventricular free wall is hypertrophic and measures up to 1.9 centimeters in greatest thickness. The papillary muscles are hypertrophic. The myocardium is red-brown, except for a focal area of gray-yellow fibrosis located in the inferior wall of the left ventricle, near the interventricular septum. This area of fibrosis is grossly consistent with a remote myocardial infarction and measures up to 2.2 centimeters in greatest dimension. The remaining myocardium is red-brown and has no evidence of acute myocardial ischemia. The mitral valve leaflets are focally hooded and redundant. The remaining pulmonic, tricuspid, and aortic valves are grossly unremarkable. The root of the aorta is slightly dilated and has minimal appreciable atherosclerotic disease. The coronary ostia are patent.

A cardiovascular pathology report performed regarding a section of "right coronary artery with stent" notes, in part:

History: ... subject was piloting a multi-engine turbo prop plane when he became unresponsive, plane was safely landed by student pilot; initial cardiac rhythm was v-fib that progressed to PEA [pulseless electrical activity] and asystole.

Received in formalin is a segment of right coronary artery measuring 14 x 8 x 5 mm. Faxitron x-ray shows focal calcification and a Cypher stent that has been transected at one end,

measuring 13 x 3.5 mm. Histologic sections show stent struts that are well apposed to the vessel wall and are completely covered. Mild chronic inflammation with giant cells surrounds some struts, but there is no persistent fibrin deposition. One section shows thin-capped fibroatheromatous plaque formation with necrotic core overlying stent struts. Near the transected end of the stent there is mild in-stent restenosis with approximately 25% luminal narrowing by neointimal proliferation. There is no luminal thrombus.

### Pilot Information

<b>Certificate:</b>	Airline transport; Commercial; Flight instructor	<b>Age:</b>	67, Male
<b>Airplane Rating(s):</b>	Single-engine land; Multi-engine land	<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	No
<b>Instructor Rating(s):</b>	Airplane multi-engine; Airplane single-engine	<b>Toxicology Performed:</b>	Yes
<b>Medical Certification:</b>	Class 2 Without waivers/limitations	<b>Last FAA Medical Exam:</b>	November 20, 2008
<b>Occupational Pilot:</b>	Yes	<b>Last Flight Review or Equivalent:</b>	March 17, 2009
<b>Flight Time:</b>	11560 hours (Total, all aircraft), 10420 hours (Pilot In Command, all aircraft), 40 hours (Last 90 days, all aircraft), 20 hours (Last 30 days, all aircraft), 5 hours (Last 24 hours, all aircraft)		

### Other flight crew Information

<b>Certificate:</b>	Private	<b>Age:</b>	56, Male
<b>Airplane Rating(s):</b>	Single-engine land	<b>Seat Occupied:</b>	Right
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	
<b>Instrument Rating(s):</b>	None	<b>Second Pilot Present:</b>	No
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	No
<b>Medical Certification:</b>	Class 3 Without waivers/limitations	<b>Last FAA Medical Exam:</b>	October 16, 2008
<b>Occupational Pilot:</b>	No	<b>Last Flight Review or Equivalent:</b>	
<b>Flight Time:</b>			

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	Beech	<b>Registration:</b>	N559DW
<b>Model/Series:</b>	B200	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>		<b>Amateur Built:</b>	
<b>Airworthiness Certificate:</b>	Normal	<b>Serial Number:</b>	BB-1036
<b>Landing Gear Type:</b>	Retractable - Tricycle	<b>Seats:</b>	10
<b>Date/Type of Last Inspection:</b>	July 30, 2008 Continuous airworthiness	<b>Certified Max Gross Wt.:</b>	12500 lbs
<b>Time Since Last Inspection:</b>		<b>Engines:</b>	2 Turbo prop
<b>Airframe Total Time:</b>	6792 Hrs	<b>Engine Manufacturer:</b>	U/A CANADA
<b>ELT:</b>	Installed, not activated	<b>Engine Model/Series:</b>	PT6A SERIES
<b>Registered Owner:</b>		<b>Rated Power:</b>	715 Horsepower
<b>Operator:</b>		<b>Operating Certificate(s) Held:</b>	None

## Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Visual (VMC)	<b>Condition of Light:</b>	Day
<b>Observation Facility, Elevation:</b>	RSW,30 ft msl	<b>Distance from Accident Site:</b>	
<b>Observation Time:</b>	13:53 Local	<b>Direction from Accident Site:</b>	
<b>Lowest Cloud Condition:</b>	Clear	<b>Visibility</b>	10 miles
<b>Lowest Ceiling:</b>	None	<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	3 knots /	<b>Turbulence Type Forecast/Actual:</b>	/
<b>Wind Direction:</b>		<b>Turbulence Severity Forecast/Actual:</b>	/
<b>Altimeter Setting:</b>	30.04 inches Hg	<b>Temperature/Dew Point:</b>	30°C / 17°C
<b>Precipitation and Obscuration:</b>	No Obscuration; No Precipitation		
<b>Departure Point:</b>	Marco Island, FL (MKY )	<b>Type of Flight Plan Filed:</b>	IFR
<b>Destination:</b>	Jackson, MS (JAN )	<b>Type of Clearance:</b>	IFR
<b>Departure Time:</b>	13:15 Local	<b>Type of Airspace:</b>	



## Airport Information

<b>Airport:</b>	Southwest Florida Int'l RSW	<b>Runway Surface Type:</b>	Asphalt
<b>Airport Elevation:</b>	30 ft msl	<b>Runway Surface Condition:</b>	Dry
<b>Runway Used:</b>	06	<b>IFR Approach:</b>	None
<b>Runway Length/Width:</b>	12000 ft / 150 ft	<b>VFR Approach/Landing:</b>	Full stop;Straight-in

## Wreckage and Impact Information

<b>Crew Injuries:</b>	1 Fatal	<b>Aircraft Damage:</b>	None
<b>Passenger Injuries:</b>	4 None	<b>Aircraft Fire:</b>	None
<b>Ground Injuries:</b>	N/A	<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	1 Fatal, 4 None	<b>Latitude, Longitude:</b>	26.536111,-81.755279(est)

## Administrative Information

<b>Investigator In Charge (IIC):</b>	Monville, Timothy
<b>Additional Participating Persons:</b>	Robert H Potts; FAA/FSDO; Orlando, FL
<b>Original Publish Date:</b>	April 19, 2010
<b>Note:</b>	
<b>Investigation Docket:</b>	<a href="https://data.nts.gov/Docket?ProjectID=73642">https://data.nts.gov/Docket?ProjectID=73642</a>

The National Transportation Safety Board (NTSB), established in 1967, is an independent federal agency mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available [here](#).