National Transportation Safety Board
Aviation Accident Final Report

Location:	Greenwood, MS	**Accident Number:**	ERA11LA224
Date & Time:	04/01/2011, 1820 CDT	**Registration:**	N146DG
Aircraft:	PIPER PA 46-350P	**Aircraft Damage:**	Substantial
Defining Event:	Landing area undershoot	**Injuries:**	2 None
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

The airplane was climbing through 13,000 feet when the pilot heard a loud "pop" and observed a large reduction in manifold pressure. He declared an emergency to an air traffic controller and initiated a slow descent to the nearest airport recommended by the controller. The pilot asked the controller if there was a mechanic at that airport and the controller stated that there was not but that a mechanic was available at another airport. The pilot elected to go to the other airport, which was farther away.

The pilot acquired the airport visually but was initially a little high and planned to enter the traffic pattern on a downwind leg for the opposite runway; the pilot lowered the landing gear to assist in losing altitude. However, the airplane was then low and the airspeed was decreasing. The pilot subsequently decided to abandon the downwind approach and land straight-in to the runway. The oil pressure gauge indicated zero and the oil warning light illuminated. The pilot continued to run the engine until he thought he could reach the runway, and then he shut down the engine. He subsequently raised the landing gear as the airplane became low, but the airspeed also decreased. He realized that he was not going to reach the runway and lined up with a grassy area short of the runway to avoid colliding with the instrument landing system. He extended the landing gear and flaps and the airplane touched down and collided with a ditch.

A postaccident examination of the engine assembly revealed that the right turbocharger would not rotate when actuated by hand. The turbocharger was removed and oil was noted in the compressor outlet tubing. Several of the blades were broken and some were bent near the tip in the direction opposite of rotation. Metallurgical examination of the right turbocharger revealed that the turbine wheel assembly failed due to a fatigue fracture of one of the turbine wheel blades, which led to an imbalance of the turbine wheel.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot did not obtain the proper touchdown point as a result of his decision to shut down the

engine and to deploy the landing gear and flaps before the landing was assured. Contributing to the accident was his decision to overfly a closer suitable airport and the fatigue fracture of a turbine blade in the right turbocharger, which led to an imbalance of the turbine wheel and the subsequent failure of the turbocharger.

Findings

Aircraft	Descent/approach/glide path - Not attained/maintained (Cause) Turbocharger - Failure (Factor)
Personnel issues	Decision making/judgment - Pilot (Cause)

Factual Information

On April 1, 2011, at 1820 central daylight time, a Piper PA-46-350P, N146DG, registered to Fountain Blue Management Services LLC, incurred substantial damage to both wings during a precautionary landing at Greenwood Le-Fore Airport (GWO), Greenwood, Mississippi, following a partial loss of engine power during climb to cruise. The certificated airline transport pilot and passenger were not injured. The personal flight was conducted under the provisions of 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed and an instrument rules flight plan was filed for the planned flight to Lakefront Airport (NEW), New Orleans, Louisiana. The flight originated from Memphis International Airport (MEM), Memphis, Tennessee at 1720.

The pilot reported that while climbing through 13,000 feet above ground level, he heard a loud "pop" and observing a large reduction in manifold pressure. The pilot decided to make a precautionary landing, declared an emergency to the air traffic control (ATC) controller, and initiated a slow descent to the nearest suitable airport recommend by ATC. The pilot asked the controller if there was a mechanic at that airport, and the controller stated no. The controller informed the pilot that GWO had a control tower and a mechanic. The pilot then decided to divert to GSO, which was further than the original alternate airport.

He obtained an amended clearance from ATC for GWO and continued his descent to avoid a cloud layer. The passenger visually identified GWO, but they were a "little high" and the pilot planned on flying a downwind leg to final approach for runway 18; however, the oil pressure was low and decreasing rapidly, so the pilot decided to land straight ahead on runway 18. He lowered the landing gear to assist in losing altitude and the oil pressure gauge indicated "0" with the oil warning light illuminated. The pilot continued to run the engine until he thought he could make the runway, and then he shut the engine down and completed the emergency landing checklist. He raised the landing gear, but the airspeed decreased. He lined up with a grassy area prior to the runway to avoid the instrument landing system and then extended the landing gear and flaps. The airplane touched down hard and collided with a ditch collapsing the nose landing gear.

Review of the aircraft logbooks revealed the last annual inspection was conducted on September 13, 2010, at a total time of 3358.8 hours. The total time on the airframe at the accident site was 3513.0 hours. The total time since engine overhaul was 1326.6 hours. According to Hartzell Engine Technologies, the turbochargers are to be overhauled at engine overhaul or 12 years(whichever comes first). Information obtained from the information data tag indicated the right turbocharger was assembled in May 1988. Both turbochargers were removed and overhauled on March 12, 2008, at an airframe time of 2,510.3 hours. The left turbocharger had been recently installed on March 30, 2011. The total time on the right turbocharger since the overhaul was 1,002.7 hours.

Examination of the crash site revealed the airplane collided with the ground with the landing gear in the extended position. Three ground scars were present on the ground extending about 300 feet to a drainage ditch. The ground scars continued past the drainage ditch for 615 feet until the airplane came to a complete stop.

The airplane was recovered to a hangar and supported on an externally braced main landing gear jack under the engine case. The engine cowlings had been removed and the nose landing gear actuator separated from the mount assembly. The propeller assembly remained attached

to the propeller crankshaft flange. The propeller spinner was not damaged. All three propeller blades remained attached to the propeller hub. Two of the three propeller blades were not damaged. The third propeller blade was separated about 6 inches outboard of the propeller de-icing boot.

The main cabin area was not damaged. All airframe control surfaces were secure and movable through full travel using the cockpit controls. Continuity of the flight controls was confirmed aft to all flight control surfaces. The flaps and landing gear were down and the pitch trim was full nose up. Cockpit controls corresponded with the positions of the gear and flaps as well as the primary and secondary control surfaces. The left and right fuel caps were secure with a tight seal and fuel was present in both fuel tanks.

The right wing remained attached at the fuselage. The main spar was twisted and the right wing exhibited diagonal wrinkling of the upper and lower leading edge wing skins and in the wheel well along the aft spar. The wing fairing had separated from the fuselage structure along the wing root. The right aileron and right flap remained attached at all hinge points. The flaps were not extended. The right main landing gear was extended and canted inboard and aft about 6 to 8 degrees.

The empennage, vertical fin, rudder, horizontal stabilizers, and elevators were not damaged.

The left wing remained attached at the fuselage. The lower section of the left main landing gear was extended and bent aft about 10 to 15 degrees. The upper section of the strut was secured to the attach points, but had twisted the main spar, which exhibited diagonal wrinkling of the upper and lower leading edge wing skins. The aft landing gear attach point was displaced upward resulting in buckling of the aft wing spar structure along the trailing edge and wrinkling of the wing skin. The wing fairing had separated from the fuselage structure along the wing root. The left aileron and right flap remained attached at all hinge points.

Examination of the engine revealed the engine was secure in its mounts and displayed no external indication of over temperature or catastrophic failure. Both magnetos were attached and not tested. All valve covers and sparkplugs were removed to facilitate engine rotation and valve train inspection. The engine was rotated by hand from the propeller. Suction and compression was observed on all cylinders, and drive train continuity was confirmed. Oil was noted on removed engine cowling pieces in the vicinity of the right turbo charger. The ducting to both turbochargers had been removed. The left turbocharger was intact and rotated when the blades were actuated by hand. The right turbo charger would not rotate when actuated by hand. Examination of the turbocharger revealed the shaft was displaced from the center on the turbine side. The turbocharger was removed and oil was noted in the compressor outlet tubing. Several of the blades were broken and some were bent near the tip in the direction opposite of rotation. Oil was leaking in the hot section and in the compressor section into the intake of the engine. The turbine side showed black deposits on the inlet case side as well as the turbine blades. The turbocharger was forwarded to the NTSB Materials Laboratory for further examination. The examination revealed the turbine wheel assembly failed due to the fatigue fracture of one of the turbine wheel blades, which led to an imbalance of the turbine wheel.

All cylinders were bore scoped. The cylinders displayed normal combustion deposits and were wet with oil discharged from the right turbocharger. The top spark plugs were wet with oil and exhibited color consistent with a rich mixture when compared to the Champion Spark Plug, Check-A-Plug wear chart. The oil filter was removed and cut open for examination. No metal

or other contaminates were noted in the filter. The propeller governor was removed and no metal was noted in the gasket screen.

The fuel distribution manifold was found safety wired with lead seals. Disassembly of the manifold found no cut off spring was installed. The diaphragm was intact and free to move. A trace amount of fuel was found in the manifold. The fuel injector nozzles were removed and were free of blockage. The fuel injector servo was separated at its mount and was not tested.

History of Flight

Initial climb	Loss of engine power (partial)
Approach	Engine shutdown
Landing	Landing area undershoot (Defining event)

Pilot Information

Certificate:	Airline Transport; Flight Instructor; Commercial	**Age:**	56, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	Airplane Single-engine; Instrument Airplane	**Toxicology Performed:**	No
Medical Certification:	Class 2 Without Waivers/Limitations	**Last Medical Exam:**	02/18/2011
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	01/07/2011
Flight Time:	8220 hours (Total, all aircraft), 2902 hours (Total, this make and model), 6461 hours (Pilot In Command, all aircraft), 112 hours (Last 90 days, all aircraft), 41 hours (Last 30 days, all aircraft), 5 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Manufacturer:	PIPER	**Registration:**	N146DG
Model/Series:	PA 46-350P	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	No
Airworthiness Certificate:	Normal	**Serial Number:**	46-36066
Landing Gear Type:	Retractable - Tricycle	**Seats:**	6
Date/Type of Last Inspection:	09/14/2010, Annual	**Certified Max Gross Wt.:**	4300 lbs
Time Since Last Inspection:	154 Hours	**Engines:**	1 Reciprocating
Airframe Total Time:	3513 Hours	**Engine Manufacturer:**	LYCOMING
ELT:	C91 installed, not activated	**Engine Model/Series:**	TIO-540 SER
Registered Owner:	FOUNTAINBLEAU MANAGEMENT SERVICES LLC	**Rated Power:**	310 hp
Operator:	Allan R. Garner	**Air Carrier Operating Certificate:**	None

Meteorological Information and Flight Plan

Observation Facility, Elevation:	GWO, 162 ft msl	**Observation Time:**	1853 CDT
Distance from Accident Site:		**Condition of Light:**	Day
Direction from Accident Site:		**Conditions at Accident Site:**	Visual Conditions
Lowest Cloud Condition:	Clear	**Temperature/Dew Point:**	18°C / 9°C
Lowest Ceiling:	None	**Visibility**	10 Miles
Wind Speed/Gusts, Direction:	4 knots, 50°	**Visibility (RVR):**	
Altimeter Setting:	29.86 inches Hg	**Visibility (RVV):**	
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Memphis, TN (MEM)	**Type of Flight Plan Filed:**	IFR
Destination:	New Orleans, LA (NEW)	**Type of Clearance:**	IFR
Departure Time:	1720 CDT	**Type of Airspace:**	Class D

Airport Information

Airport:	Greenwood-Leflore Airport (GWO)	**Runway Surface Type:**	
Airport Elevation:	162 ft	**Runway Surface Condition:**	Dry
Runway Used:	18	**IFR Approach:**	None
Runway Length/Width:	6503 ft / 150 ft	**VFR Approach/Landing:**	Forced Landing; Straight-in

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 None	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 None		

Administrative Information

Investigator In Charge (IIC):	Carrol A Smith	**Adopted Date:**	02/23/2012
Additional Participating Persons:	Jacob H Corbett; FAA Jackson FSDO; Jackson, MS John B Butler; Textron Lycoming; Arlington, TX Michael C MC Clure; Piper Aircraft Inc.; Duncanville, TX Tom M McCreary; Hartzell; Cape Coral, FL		
Publish Date:	02/23/2012		
Investigation Docket:	http://dms.ntsb.gov/pubdms/search/dockList.cfm?mKey=78743		

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