National Transportation Safety Board
Aviation Accident Final Report

Location:	LITTLEFIELD, AZ	**Accident Number:**	LAX96FA339
Date & Time:	09/20/1996, 1939 MST	**Registration:**	N6468H
Aircraft:	Cessna T207A	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General Aviation - Positioning		

Analysis

The airplane was being positioned to another airport at night. The flight was over mountainous terrain. The airplane collided with the top of a 4,600-foot bluff. The pilot had a history of transient global amnesia. Examination of the accident site revealed a 567-foot long wreckage path, oriented along the direct course line from the departure point to the destination. Damage to the engine and propeller indicated that the engine was developing power at impact.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's failure to maintain clearance with terrain during descent for undetermined reasons. Contributing factors were the dark night and mountainous terrain.

Findings

Occurrence #1: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - NORMAL

Findings
1. (F) TERRAIN CONDITION - MOUNTAINOUS/HILLY
2. DESCENT - PREMATURE - PILOT IN COMMAND
3. PHYSIOLOGICAL CONDITION - PILOT IN COMMAND
4. (C) CLEARANCE - NOT MAINTAINED - PILOT IN COMMAND
5. (C) REASON FOR OCCURRENCE UNDETERMINED
6. (F) LIGHT CONDITION - DARK NIGHT

Factual Information

HISTORY OF THE FLIGHT

On September 20, 1996, about 1939 hours mountain standard time, a Cessna T207A, N6468H, collided with mountainous terrain about 15 miles southeast of Saint George, Utah. The airplane was destroyed and the airline transport pilot was fatally injured. The airplane was being operated by Scenic Airlines, Inc., Page, Arizona, as a positioning flight under 14 CFR Part 91. The flight departed the Grand Canyon National Park Airport (GCN) at 1851 and was destined for Saint George (SGU). Visual meteorological conditions prevailed at the time and a company VFR flight plan was filed.

The pilot had been given the task of repositioning the airplane which was coming due for an 100-hour inspection. This was the pilot's first flight in the accident airplane that day. The pilot was based at SGU and had arrived at GCN in another airplane at 1757. Scenic Airlines flight dispatch in Page, Arizona, was following the flight. The pilot phoned Page dispatch and informed them of his arrival. According to Page dispatch, the phone call was brief and the pilot indicated that he was getting ready to leave.

About 2000, Page dispatch contacted Scenic Airlines station manager in Saint George to check if the flight had arrived. The station manager indicated he had given the pilot permission to perform several night takeoffs and landings for the purpose of maintaining night currency. The dispatcher extended the flight's estimated time of arrival by 45 minutes.

About 2100, the Saint George station manager contacted the Page dispatcher and informed him the flight had not arrived. The dispatcher initiated Scenic Airlines search procedures. The airplane was found during daylight hours the following day by another aircraft.

PILOT INFORMATION

The pilot held an airline transport rating for multiengine airplanes with commercial pilot privileges for single engine airplanes. The pilot's most recent first class medical certificate was issued on April 11, 1996, and contained the limitation that correcting lenses must be worn for distant vision, correcting lenses must be in possession for near vision, and a hearing aid must be worn while exercising the privileges of his airman certificate. The pilot's height was list as 65 inches and weight as 156 pounds during his medical exam.

The pilot's most recent logbook was reviewed by the Safety Board. All of the pilot's personal flight records were not located, and the aeronautical experience listed in this report was obtained from a review of the FAA airmen records on file in the Airman and Medical Records Center located in Oklahoma City. In addition, information was obtained from Scenic Airlines records.

The pilot reported on his medical certificate application that his total aeronautical experience consisted of 23,000 hours. According to Scenic Airlines, the pilot had accrued over 1,000 hours in single engine airplanes, of which 6.8 hours were accrued in the Cessna 207. In the preceding 90 and 30 days prior to the accident, the pilot's logbook lists a total of 66 and 16 hours flown, respectively, of which about 2.6 hours were in the Cessna 207.

AIRCRAFT INFORMATION

The airplane was manufactured on May 25, 1979, and had accumulated a total time in service

of 10,008.5 hours. At the time of manufacture, the airplane was equipped with long range fuel tanks for a total fuel volume of 80 gallons, of which 73 gallons is usable and 7 gallons total unusable. There was no autopilot installed in the airplane.

Examination of the maintenance records revealed that the most recent 50-hour inspection was completed on September 6, 1996, 47.2 hours before the accident. The last 100-hour inspection was accomplished on August 21, 1996, 97.2 hours before the accident. During both the 100-hour and the 50-hour inspections a recurring airworthiness directive (AD 71-09-07R1) concerning the exhaust manifold heat exchanger was accomplished.

A Teledyne Continental TSIO-520-M7 engine was installed in the airframe in October, 1995. The engine had accrued a total time in service of 469.1 hours since remanufacture. An Allied Signal Aerospace Model TE0659 turbocharger was installed on the airframe on October 11, 1995, and had accrued a total time in service of 469.1 hours since overhaul. The last inspections of the engine and turbocharger were accomplished on the date specified above for the airframe.

According to Scenic Airlines, the airplane was to be refueled before departure from GCN. There was no record found establishing that the airplane had been refueled.

The airplane was flown from Page, Arizona (PGA) to Monument Valley, Utah (71V) on the day of the accident. According to the pilot who flew the flight, he departed PGA with the right fuel tank full (36.5 gallons usable) and 20 gallons (17 gallons usable) in the left tank. The pilot indicated that he used about 15 to 16 gallons of fuel for the flight; an estimated 10 gallons from the left fuel tank and 5 to 6 gallons from the right tank. The pilot also stated, "There were no major items of a mechanical nature on the aircraft noted by me," and "All indications throughout my flight were normal and no unusual fuel flow was noted." According to the Scenic Airlines Flight and Maintenance Log, the pilot recorded .7 of an hour tachometer time during the 60 nautical mile flight.

The pilot who flew the airplane from 71V to GCN recorded 1.2 hours tachometer time on the Scenic Airlines Flight and Maintenance Log during the 114 nautical mile flight. After the flight, he placed a fuel slip on the airplane's glareshield requesting the right tank be topped. The pilot did not indicate there were any mechanical discrepancies on the maintenance log. The airplane's engine was started again by a third person and the airplane was taxied to another parking row. The fuel request slip was moved from the glareshield to the access door for the oil dipstick on the engine cowling.

METEOROLOGICAL INFORMATION

The closest official weather observation station was the Saint George Municipal Airport which is located 12.7 nautical miles west-northwest of the accident site. The elevation of the weather observation station is 2,938 feet above sea level (msl). At 1956 mountain standard time, the surface observation was reporting in part: sky condition and ceiling clear; visibility 10 statute miles; temperature 79 degrees Fahrenheit; dew point 25 degrees Fahrenheit; winds 290 degrees at 8 knots; altimeter 29.95 inHg.

WRECKAGE AND IMPACT INFORMATION

The airplane struck the top of the western edge of a 4,600-foot mesa. The wreckage path extended about 567 feet and was oriented on a global positioning system (GPS) computed 307.2 degree magnetic azimuth. The GPS computed magnetic azimuth from the initial impact

point to SGU was 307.7 degrees. The longitudinal axis of the mesa in the accident area was oriented towards SGU.

The initial impact point was marked with an aluminum transfer on a rock. The propeller hub and the three propeller blades separated from the engine through a fracture in the hub. The components were found on top of the mesa in the wreckage path. One blade remained attached to the hub and was found about 530 feet from the initial impact point. The airplane's propeller blades exhibited chordwise scoring and gouging that was overlaid with spanwise gouging and scoring.

The fuselage and wings were found about 265 feet on a 299-degree magnetic azimuth from the initial impact point. The fuselage came to rest inverted on the attach point for the left wing, the vertical stabilizer, and the left horizontal stabilizer. The fuselage was rolled left about 45 degrees, allowing the left main landing gear to penetrate the left wing aft of the fuel tank. The front of the airplane was oriented in a direction opposite of the flight path.

The fuselage was crushed and shredded on the belly from the firewall rearward to the main landing gear. The forward baggage compartment was crushed pinning fly away gear and other items. The nose gear and right main landing gear were separated and were found in pieces along the wreckage path between the initial impact point and fuselage. The empennage had a circumferential buckle at the forward end of the vertical stabilizer dorsal fin in the vicinity of the rear cargo compartment bulkhead.

The left wing remained attached to the fuselage and was found laying on the ground inverted. The left wing tip was broken off. Fragments of the wing tip were found in the debris in the wreckage path. The wing strut was found broken where it attaches to the fuselage. The leading edge of the left wing was crushed aft outboard of the wing strut. The flap panel on the left wing was in the up position. Ten gallons of aviation gasoline were drained from the airplane's left fuel tank. There was an estimated 2 to 3 gallons of fuel in the left tank that was lost during the wreckage recovery.

The right wing was found on the right side of the fuselage parallel to the longitudinal axis of the empennage. The wing was resting on the trailing edge with the leading edge straight up. The flap panel on the right wing was in the up position. The wing was supported by the wing strut that remained attached at both ends, the right horizontal stabilizer, and the flight control cables at the root. The leading edge of the right wing was crushed aft. The crushed area started in the area of the strut attach point and arched aft the full chord width to the wing tip.

The right wing fuel cap was found in place on the fuel tank servicing inlet. The fuel lines were separated at the wing root. There was no evidence found of fuel leaking on the ground at the accident site. About 1 liter of fuel was captured from the right tank with an estimated 1 liter remaining. There was no evidence of contamination in any of the fuel collected.

The right wing was transported to SGU and the two fuel lines and the vent line were capped. Water was added to the fuel tank through the cap to check for ruptures or leaks. There was no evidence found of the right fuel tank leaking.

The engine was separated from the fuselage and was found 567 feet from the initial impact point resting inverted. There was a puncture hole in the oil sump. The engine control cables were found broken. The propeller governor lever, the mixture lever, and the fuel control lever on the fuel control were found pulled towards the firewall. The throttle control was found in a mid range position, the propeller control was found in the high rpm position, and the mixture

control was found in the full rich position. The fuel selector valve was found in the "RIGHT ON 36.5 GAL" position.

Control continuity was established for the flight controls.

MEDICAL AND PATHOLOGICAL INFORMATION

A post mortem examination was conducted by Mohave County Coroner's Office on September 22, 1996, with specimens retained for toxicological examination. The toxicological examination was performed by Associated Pathologists Laboratories, Las Vegas, Nevada. The results of the toxicological analysis were negative volatiles in the blood specimen and negative for drug screens in the urine specimen. There were insufficient specimen samples to perform tests for carbon monoxide, hemoglobin, and cyanide.

A review of records from the FAA's Aeromedical Certification Division revealed the pilot had a history of transient global amnesia (TGA). In a June 21, 1995 letter to the pilot, the division informed him of his eligibility for a first-class medical certificate, and instructed him to do the following:

"You are cautioned to abide by Federal Aviation Regulations, Section 61.53, relating to physical deficiency. Because of your history of transient global amnesia, operation of aircraft is prohibited at any time new symptoms or adverse changes occur or any time medication is required."

According to Harrison's Principles of Internal Medicine, 15th edition, transient global amnesia is characterized by sudden onset of complete anterograde loss of memory and learning abilities, usually occurring in persons over age 50. Onset of memory loss may occur in the context of an emotional stimulus or physical exertion. During the attack the individual is alert and communicative, general cognition seems intact, and there are no other neurological signs or symptoms. The patient may seem confused and repeatedly ask about present events. The ability to form new memories returns after a period of hours, and the individual returns to normal but has no recall for the period of the attack.... About one-fourth of the patients had recurrent attacks.... Rare instances of permanent memory loss after sudden onset have been reported.

TESTS AND RESEARCH

Engine Examination

The engine was recovered from the accident scene and examined at Scenic Airlines maintenance facilities in Saint George on September 22, 1996. There was no evidence found of mechanical failure with the engine during the examination.

Continuity was established with all reciprocating and rotating parts. Thumb compression was noted in all cylinders. The magnetos produced sparks at the ignition leads when rotated by hand. The spark plugs exhibited normal wear patterns as compared to the Champion spark plug "Aviation Check-A-Plug" illustrations. The lubrication system was clear of any obstructions. There was no evidence found of heat distress in any of the bearings or cylinders.

Turbocharger System Examination

The turbocharger, fixed absolute pressure controller, the waste gate and pressure relief valve were examined at the Allied Signal Automotive facility in Torrance, California, on November 8, 1996. Allied Signal records indicated that the turbocharger had been factory overhauled in

February, 1995.

The turbocharger would not rotate. The turbine housing was punctured inward. The turbine blade tips were damaged and the housing was scored with deep gouges. A rock and several pieces of the turbine blades were found inside the housing.

The compressor section exhibited damage to the inner portions of the housing and compressor wheel. The compressor blade tips were found bent opposite the direction of rotation. The compressor housing was scored approximately 90 degrees along its internal circumference.

The center housing of the turbocharger was not damaged. The oil passages were unobstructed and retained a small amount of residual oil. The bearings appeared well lubricated and exhibited no evidence of distress.

The fixed absolute pressure controller was overhauled by the manufacturer in June, 1995. The unit was installed on the airplane on October 11, 1995, the same date as the turbocharger. The controller was tested and found functional.

The pressure relief valve and waste gate were damaged by impact and could not be tested. Both units were installed on the airplane on the same date as the turbocharger. The data plate on the waste gate indicated it was new and built in April, 1995. The pressure relief valve was overhauled in March, 1995.

According to the manufacturer, the turbocharger was operating at the time of impact as indicated by the scoring of the compressor and turbine.

Radar Data

The pilot was not receiving air traffic control services from the Federal Aviation Administration (FAA). There was no discreet transponder code assigned to the pilot. The FAA provided radar data from their national track analysis program (NTAP) based on estimated accident time and location of the accident site.

Review of the radar data revealed a 6-minute sequence of 39 primary targets that terminated .25 nautical miles south-southeast of the airplane's initial impact point. The data did not include any altitude information. The bearing between each individual target varied from 302 degrees to 344 degrees. The time of the last primary target was at 19:38:45.

ADDITIONAL INFORMATION

The wreckage was released to Scenic Airlines on September 22, 1996. The turbocharger system was retained for further examination and released to Scenic Airlines on October 8, 1996.

Pilot Information

Certificate:	Airline Transport	**Age:**	68, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Seatbelt
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 1 Valid Medical--w/ waivers/lim.	**Last FAA Medical Exam:**	04/11/1996
Occupational Pilot:		**Last Flight Review or Equivalent:**	
Flight Time:	23000 hours (Total, all aircraft), 7 hours (Total, this make and model), 19000 hours (Pilot In Command, all aircraft), 66 hours (Last 90 days, all aircraft), 16 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N6468H
Model/Series:	T207A T207A	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	No
Airworthiness Certificate:	Normal	**Serial Number:**	207 00532
Landing Gear Type:	Tricycle	**Seats:**	7
Date/Type of Last Inspection:	09/06/1996, Continuous Airworthiness	**Certified Max Gross Wt.:**	3800 lbs
Time Since Last Inspection:	47 Hours	**Engines:**	1 Reciprocating
Airframe Total Time:	10009 Hours	**Engine Manufacturer:**	Continental
ELT:	Installed, activated, aided in locating accident	**Engine Model/Series:**	TSIO-520-M7
Registered Owner:	SCENIC AIRLINES, INC.	**Rated Power:**	310 hp
Operator:	SCENIC AIRLINES, INC.	**Operating Certificate(s) Held:**	On-demand Air Taxi (135)
Operator Does Business As:		**Operator Designator Code:**	SCIA

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	**Condition of Light:**	Night/Dark
Observation Facility, Elevation:	SGU, 2938 ft msl	**Distance from Accident Site:**	13 Nautical Miles
Observation Time:	1956 MST	**Direction from Accident Site:**	308°
Lowest Cloud Condition:	Clear / 0 ft agl	**Visibility**	10 Miles
Lowest Ceiling:	None / 0 ft agl	**Visibility (RVR):**	0 ft
Wind Speed/Gusts:	8 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	290°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29 inches Hg	**Temperature/Dew Point:**	79°C / 25°C
Precipitation and Obscuration:			
Departure Point:	GRAND CANYON, AZ (GCN)	**Type of Flight Plan Filed:**	Company VFR
Destination:	ST. GEORGE, UT (SGU)	**Type of Clearance:**	None
Departure Time:	1851 MST	**Type of Airspace:**	Class G

Airport Information

Airport:	ST GEORGE MUNICIPAL (SGU)	**Runway Surface Type:**	Asphalt
Airport Elevation:	2938 ft	**Runway Surface Condition:**	
Runway Used:	34	**IFR Approach:**	None
Runway Length/Width:	6101 ft / 100 ft	**VFR Approach/Landing:**	Full Stop; Straight-in

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	N/A	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal	**Latitude, Longitude:**	

Administrative Information

Investigator In Charge (IIC):	THOMAS H WILCOX	**Report Date:**	08/26/2002
Additional Participating Persons:	DALE NELSON; LAS VEGAS, NV ANDREW HALL; WICHITA, KS STEVEN S MACON; PHOENIX, AZ JOHN LITERMOET; NORTH LAS VEGAS, NV		
Publish Date:			
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