



National Transportation Safety Board Aviation Accident Final Report

Location:	Las Vegas, Nevada	Accident Number:	SEA08FA023
Date & Time:	November 8, 2007, 19:18 Local	Registration:	N881CP
Aircraft:	Cessna T182T	Aircraft Damage:	Destroyed
Defining Event:		Injuries:	2 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

"THIS CASE WAS MODIFIED JANUARY 27, 2009."

The airplane collided with rising mountainous terrain during climb to cruise about 21 nm southwest of the departure airport. The accident occurred during dark night, visual meteorological conditions, about 13 minutes into the night cross-country flight. No lighted roads or round structures were present in the area to provide ground reference to terrain. 1% of the moon's disk was illuminated. Over the last 6 minutes of the flight, recorded radar data indicated the airplane's average groundspeed was 100 knots and its average rate of climb was 406 fpm; an average rate of climb of 600 fpm was required to clear terrain along the flight path. An examination of the accident site indicated that the airplane impacted rapidly rising terrain in a near level flight attitude before descending and coming to rest in a rock outcropping. The resultant high-energy impact forces, coupled with the extensive thermal damage, destroyed the airplane. A postaccident examination of the airframe's structure and engine failed to reveal any preimpact failures or malfunctions. The airplane was equipped with a Garmin G1000 Integrated Cockpit System, which incorporates a multifunction color display that is capable of displaying terrain elevation information when selected to the Terrain Proximity page. Due to the extensive impact and thermal damage that the component had sustained, it was not possible to determine if the pilot was using the display to receive topographic data during the airplane's ascent. Records indicate that the pilot had received G1000 training. The Pilot's Guide for the G1000 states: "CAUTION: Use of Terrain Proximity information for primary terrain avoidance is prohibited. The Terrain Proximity Map is intended only to enhance situational awareness. It is the pilot's responsibility to provide terrain avoidance at all times." The flight was departing on a VFR flight plan and was receiving VFR flight following services from the Las Vegas Terminal Radar Approach Control facility. Air traffic control radar data revealed that the airplane was continuously visible to the controller on his radar display from the departure airport until impact with mountainous terrain. The airplane's course remained constant as he approached and impacted the mountain during the dark nighttime flight. The air traffic controller did not issue a terrain-related safety alert, as

required by a Federal Aviation Administration order, because he did not observe a conflict with terrain.

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 an adequate terrain clearance/altitude during climb to cruise. Contributing to the accident were rising mountainous terrain, the dark nighttime lighting condition, the pilot's loss of situational awareness, and the Federal Aviation Administration controller's failure to issue a terrain-related safety alert.

Findings

Occurrence #1: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: CLIMB - TO CRUISE

Findings

1. (F) TERRAIN CONDITION - RISING
2. (F) TERRAIN CONDITION - MOUNTAINOUS/HILLY
3. (F) LIGHT CONDITION - DARK NIGHT
4. (C) ALTITUDE/CLEARANCE - NOT MAINTAINED - PILOT IN COMMAND
5. (F) OTHER PSYCHOLOGICAL CONDITION - PILOT IN COMMAND
6. (F) PROCEDURES/DIRECTIVES - NOT FOLLOWED - ATC PERSONNEL(ARTCC)
7. (F) SAFETY ADVISORY - NOT ISSUED - ATC PERSONNEL(ARTCC)

Factual Information

"THIS CASE WAS MODIFIED JANUARY 27, 2009."

HISTORY OF FLIGHT

On November 8, 2007, about 1918 Pacific standard time, a Cessna T182T, N881CP, was destroyed after impacting mountainous terrain during climb to cruise near Potosi Mountain, about 13 nautical miles southwest of Las Vegas, Nevada. The airplane was registered to the Civil Air Patrol, Maxwell Air Force Base, Montgomery, Alabama. The left-seat first pilot and right-seat second pilot, both of whom possessed airline transport pilot certificates, were killed. Visual meteorological dark night conditions prevailed for the 14 Code of Federal Regulations (CFR) Part 91 personal cross-country flight, and a visual flight rules (VFR) flight plan had been filed and activated at the time of the accident. The flight departed the North Las Vegas Airport (VGT), Las Vegas, Nevada, about 1905, and was destined for the Rosamond Skypark (LOO), Rosamond, California.

At 1822 the pilot of N881CP filed a VFR flight plan from VGT to LOO and stated that he did not need a weather briefing. Air Traffic Control recorded the flight as CAP Flight 2793.

The Federal Aviation Administration's (FAA) recorded data indicates that after departing VGT on Runway 30L, the airplane turned to a southwesterly heading.

At 1905:29, the pilot made the following transmission: "Las Vegas departure, Cap Flight 2793 is with you. We're leaving, ah, twenty-seven hundred for ten point five." The controller responded, "Cap Flight twenty-seven ninety-three, Las Vegas departure. Ident, and ah, remain outside of class Bravo airspace." The pilot acknowledged the controller's instructions.

At 1905:49, the controller transmitted, "Cap Flight twenty-seven ninety-three, radar contact two miles south of North Las Vegas Airport. Verify climbing two-thousand seven-hundred." The pilot responded, "That's affirmative."

At 1906:05, the controller asked the pilot to verify his destination. The pilot replied, "We're going, ah, to Rosamond, California." The controller replied, "Cap Flight twenty-seven ninety-three, roger." At this time the airplane's altitude was 2,800 feet mean sea level (msl).

At 1906:34, the controller advised the pilot, "Cap Flight twenty-seven ninety-three, traffic eleven o'clock, four miles west bound is a metro helicopter climbing three-thousand five-hundred." The pilot replied, "Twenty-seven ninety-three, we have him." The airplane's altitude was now 3,100 feet msl.

At 1907:42, the pilot radioed to the controller, "And Cap Flight twenty-seven ninety-three, we would like to leave frequency for a minute to open a flight plan." The controller granted the pilot's request and asked him to confirm that he still had the helicopter in sight. The pilot replied, "That's affirmative." The controller replied, "Cap Flight, ah, twenty-seven ninety-three, roger. Maintain visual separation, and, ah, approved as requested." The pilot replied, "Alright."

The airplane's altitude was 3,500 feet msl.

At 1908:25 and 1908:40 the pilot attempted to contact Reno radio to open his flight plan; the flight service station (FSS) specialist reported that both transmissions were unintelligible. At this time the airplane's altitude was about 3,600 feet msl.

At 1909:48 the pilot transmitted to Reno radio, "Flight two seven niner three departed North Las Vegas five minutes past the hour. Open my flight plan please." The FSS specialist replied, "Cap Flight two seven niner three, roger. VFR flight plan activated." The airplane was now at 4,100 feet msl.

At 1910:30, the pilot asked the controller, "Can, ah, Cap Flight twenty-seven ninety-three get higher?" The airplane's altitude was now 4,200 feet msl.

At 1910:33, the controller responded, "Cap Flight, ah, twenty-seven ninety-three contact approach one two, or correction, climb to VFR requested altitude outside of class Bravo airspace. Contact approach one two five point niner." The pilot replied, "Twenty-five nine, changing." The airplane's altitude was 4,200 feet msl.

At 1910:50, the pilot transmitted to the controller, "Approach, Cap Flight twenty-seven ninety-three is with you. We're leaving forty-four hundred for ten point five." The controller replied, "And Cap Flight twenty-seven ninety-three, Las Vegas departure. Roger." The airplane's altitude was 4,400 feet msl.

At 1911:55, the controller asked the pilot, "Cap Flight twenty-seven ninety-three, what's your requested on course heading, and how high you want to go?" The pilot responded, "We would like, ah, ten point five, and we are at two one zero." The airplane's altitude was 4,800 feet msl.

At 1912:06, the controller responded, "Roger. Proceed on course. VFR climb to ten point five approved." The pilot replied, "Cap Flight twenty-seven ninety-three, thank you." The airplane's altitude was 4,900 feet msl.

At 1917:29 radar contact was lost. There was no further radio communication received from the flight. The last recorded altitude was 7,000 feet msl.

A local law enforcement officer/pilot, who was assigned to the Las Vegas Metropolitan Police Department's Air Support/Search and Rescue Unit, reported that on the evening of the accident, while flying a helicopter patrol mission and heading in a south-southwest direction, he observed a large fireball/explosion in the vicinity of Mount Potosi, elevation 8,514 feet msl. The officer stated that his partner also observed and confirmed that it was an explosion. The officer reported that while en route to the area of the fire he observed additional fireballs, and upon arriving at the accident site his partner confirmed that the fire was the result of an airplane crash. One officer described the area as void of any lighting which would aid in the illumination of terrain.

On November 10, 2007, onsite documentation of the accident site revealed that the airplane had impacted a near vertical rock face on the southeast side of Mount Potosi, about 1,000 feet

below its summit. A survey of the accident site revealed that all airplane components necessary for flight were identified. One propeller blade was not accounted for during the initial onsite examination, nor during the recovery phase of the wreckage.

On November 13, 2007, the airplane was recovered to a secured storage facility for further examination by parties to the investigation.

PERSONNEL INFORMATION

The First Pilot

The left-seat first pilot, age 73, possessed an FAA airline transport pilot certificate for airplane multiengine land and commercial privileges for airplane single-engine land. The pilot also possessed multiple airline transport category type ratings, a turbojet flight engineer rating, as well as flight navigator certification. It was reported by Civil Air Patrol personnel that the pilot had accumulated a total flight time of 25,000 hours. The pilot's personal logbooks were not accounted for during the investigation.

The pilot held a second-class FAA airman's medical certificate, which was issued on September 10, 2007, with the limitation "Must have available glasses for near vision."

The pilot had been the CAP's Nevada Wing Commander since 2003. According to a flight log provided by the Nevada Wing of the CAP, the pilot had accumulated 74.7 hours in Garmin 1000 (G1000) equipped Cessna airplanes, and 34.2 hours in the accident airplane. The pilot had received G1000 training from a CAP instructor; the instructor was factory trained at the Cessna training facility in Independence, Missouri. The pilot's training was conducted in accordance with the Cessna FAA/Industry Training Standards (FITS) training program. The curriculum included 3 ground school sessions of 4 hours each, and three training flights of 2 hours each.

The Second Pilot

The right-seat second pilot, age 71, possessed an airline transport pilot certificate for airplane single-engine land, multiengine land, and single-engine sea. The pilot also held an airline transport pilot certificate for rotorcraft-helicopters and commercial privileges for gliders. Additionally, the pilot possessed a flight instructor certificate for single and multiengine airplanes, instrument airplane, helicopters, and gliders. The pilot also possessed advanced and instrument ground instructor certification, a flight engineer certificate for turbojet and turbopropeller airplanes, airframe and powerplant mechanic certification, and flight navigator certification. The pilot held multiple airline transport category type ratings for both helicopters and airplanes. CAP personnel reported that the pilot had accumulated more than 28,000 hours of flight time, comprised of both military and civilian flying experience. The pilot's personal logbooks were not accounted for during the investigation.

The pilot possessed a first-class FAA airman's medical certificate, which was issued on May 25, 2007, with the limitation "Must wear corrective lenses."

Civil Air Patrol personnel reported that the pilot had served in the CAP for more than 50 years. At the time of the accident the pilot was the Director of Operations for the CAP's Pacific Region. The pilot was also the former National Vice Commander, serving in the capacity for one year before serving as the Pacific Region commander for four years. Additionally, the pilot had held the position as the California Wing Commander. It was further reported by CAP personnel that the pilot had not been trained in CAP G1000 equipped airplanes, and was not authorized to fly G1000 equipped CAP airplanes.

AIRCRAFT INFORMATION

The 2006-model Cessna T182T airplane underwent its most recent annual inspection on September 7, 2007, at a total time on the airframe and engine of 300.8 hours. The airplane's most recent tachometer reading was recorded on November 7, 2007, at a total time of 338.7 hours. There was no record of the airplane having been involved in any previous airplane accidents.

The turbocharged, autopilot-equipped airplane was equipped with a Garmin G1000 Integrated Cockpit System. The system incorporates a Primary Flight Display (PFD) and a Multi Function Display (MFD). The MFD allows the pilot to access the Terrain Proximity Page, which provides the pilot with terrain elevation relative to the airplane's altitude, current aircraft location, range marking rings, a heading box, and obstacles. The Terrain Avoidance and Warning System (TAWS) option was not installed on the airplane.

The following statement is printed in the Garmin G1000 Pilot's Guide for Cessna Nav III: "CAUTION: Use of Terrain Proximity information for primary terrain avoidance is prohibited. The Terrain Proximity Map is intended only to enhance situational awareness. It is the pilot's responsibility to provide terrain avoidance at all times."

AIR TRAFFIC CONTROL

Radar Data

A National Transportation Safety Board Air Traffic Control Investigator reviewed the radar data for the accident flight. The investigator reported that radar data for this accident was obtained from the LAS Airport Surveillance Radar-9 (ASR-9) sensor as recorded by the Las Vegas Terminal Radar Approach Control (L30) Standard Terminal Automation Replacement System (STARS), which indicated that Cap Flight 2793 was continuously visible from departure at VGT until impact with Mt. Potosi. The radar also displayed an image of the symbol depicting Mt. Potosi as Cap Flight 2793 approached the obstacle just prior to the accident.

Interviews with Air Traffic Control personnel

In an interview with the L30 Daggett/Mead radar controller, the controller stated that VFR aircraft en route to the Bakersfield area usually pass north of Mt. Potosi, while aircraft en route to the Southern California area pass further south. The controller reported that he does not handle VFR traffic flying at night any differently than he does in the daytime, and that he did

not notice anything unusual about the accident aircraft as it headed toward Mt. Potosi. The controller stated, "It looked just like other aircraft passing through the area." The controller stated that he knew that the height of Mt. Potosi was 8,500 feet.

In an interview with the Daggett radar controller, who had just relieved the L30 Daggett/Mead radar controller and was controlling Cap Flight 2793 at the time of the accident, the controller reported that when he was relieved he was informed that the accident airplane was climbing to its requested altitude, 10,500 feet. The controller stated, "The aircraft looked fine - there was nothing unusual about it. When questioned about where he expected the aircraft to go the controller replied that "...the pilot was on his own navigation." The controller stated that other aircraft he has seen go where the accident aircraft was, and some go further south. Asked when he is required to issue a safety alert, the controller stated, in his opinion, when an aircraft is close to terrain or other aircraft. The controller stated that he knew that the height of Mt. Potosi was 8,500 feet. (See the National Transportation Safety Board's Air Traffic Control Group Chairman's Factual Report for additional details.)

Safety Alerts, FAA Air Traffic Control Order 7110.65

FAA Order 7110.65 states, in part, that a controller's duty priority is to "give first priority to separating aircraft and issuing safety alerts..." The safety alert is to be issued to an aircraft once the controller observes and recognizes a situation wherein the aircraft is in unsafe proximity to terrain, obstacles, or other aircraft. The controller "...must remain vigilant for such situations."

METEOROLOGICAL INFORMATION

At 1856, the Automated Surface Observing System (ASOS) at the McCarran International Airport (LAS), Las Vegas, Nevada, located about 19 nautical miles northeast of the accident site, reported wind 240 degrees at 3 knots, visibility 10 miles, few clouds at 18,000 feet, broken clouds at 25,000 feet, temperature 23 degrees C, dew point -1 degree C, and an altimeter setting of 29.95 inches of Mercury.

According to the U.S. Naval Observatory, Department of Astronomical Applications, the phase of the moon was waning crescent (not seen anytime before midnight) with 1% of the moon's visible disk illuminated. Moonrise was at 0605 on the following day.

WRECKAGE AND IMPACT INFORMATION

On November 10, 2007, the NTSB IIC, accompanied by representatives from the FAA, United States Air Force, and Cessna Aircraft Company examined the wreckage at the accident site. The examination revealed that the airplane had impacted rapidly rising terrain nose first in an approximate level flight attitude, about 21 nautical miles southwest of VGT, elevation 2,205 feet msl. The impact site was located about .6 miles southeast of the summit of Mount Potosi, elevation 8,514 feet msl. The airplane had impacted the terrain on a magnetic heading of about 210 degrees, subsequently falling about 30 feet before coming to rest on a rock outcropping at an elevation of about 7,450 feet msl. A large burn mark above the outcropping was consistent with the airplane's initial impact point.

An examination of the accident site revealed that the fuselage had been consumed by fire from the engine compartment aft to about fuselage station 172. All flight and engine instruments sustained extensive impact and thermal damage. The empennage came to rest in an inverted position, with the top of the right horizontal stabilizer observed crushed downward near its inboard edge causing damage to the right horizontal stabilizer leading edge. The leading edge of the right horizontal stabilizer exhibited aft crushing to its top at approximately midspan. The leading edges of both wings were observed to have been crushed aft.

Flight control cable continuity was established and confirmed for the rudder and elevators. Aileron control continuity was partially confirmed, with aileron cables observed attached to their respective bellcranks. Elevator trim tab control cable continuity was partially established.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy was performed on each pilot by the Clark County Coroner's Office, Las Vegas, Nevada. According to the autopsy reports, the cause of death for both pilots was "Multiple blunt force trauma."

The FAA Civil Aerospace Medical Institute (CAMI) prepared a Final Forensic Toxicology Accident Report from samples taken at each pilot's autopsy. The left seat first pilot's CAMI report indicated samples sustained putrefaction. The right seat second pilot's CAMI report indicated no putrefaction. The CAMI toxicology for the right seat second pilot was negative for the tests performed. The CAMI toxicology report for the left seat first pilot stated:

15 (mg/dL, mg/hg) ETHANOL detected in Liver
49 (mg/dL, mg/hg) ETHANOL detected in Muscle
3 (mg/dL, mg/hg) N-PROPANOL detected in Muscle

DIPHENHYDRAMINE detected in Kidney
DIPHENHYDRAMINE detected in Liver

TESTS AND RESEARCH

A postaccident examination of the airframe's structure and engine failed to reveal any preimpact failures or malfunctions, which would have precluded normal operation.

An examination of the airplane's avionics components revealed that they were too thermally and impact-damaged to provide any data.

Radar data for the last 6 minutes of flight, during which the flight was clear of class B airspace and cleared to climb to its cruise altitude of 10,500 feet msl, indicated that the airplane's average groundspeed was 100 knots, its average rate of climb was 406 feet per minute (fpm), and its average magnetic heading was 222 degrees. Based on this information, a calculated rate of climb of 596 fpm would have been required to have safely cleared the terrain along the flight's path.

Controlled Flight Into Terrain (CFIT)

On March 1, 2003, the Federal Aviation Administration issued Advisory Circular number 61-134, "General Aviation Controlled Flight Into Terrain Awareness." The circular was issued to the general aviation community to "...emphasize the inherent risk that controlled flight into terrain (CFIT) poses for general aviation (GA) pilots."

The circular defines CFIT as a situation which "...occurs when an airworthy aircraft is flown under the control of a qualified pilot, into terrain (water or obstacles) with inadequate awareness on the part of the pilot of the impending collision."

According to the CFIT circular, "situational awareness" is defined as "...when the pilot is aware of what is happening around the pilot's aircraft at all times in both the vertical and horizontal plane. This includes the ability to project the near term status and position of the aircraft in relation to other aircraft, terrain, and other potential hazards."

Pilot Information

Certificate:	Airline transport; Commercial; Flight engineer	Age:	73, Male
Airplane Rating(s):	Single-engine land; Multi-engine land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	None	Toxicology Performed:	Yes
Medical Certification:	Class 1 With waivers/limitations	Last FAA Medical Exam:	September 10, 2007
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	
Flight Time:	25000 hours (Total, all aircraft)		

Pilot Information

Certificate:	Airline transport; Commercial; Flight engineer; Flight instructor	Age:	71, Male
Airplane Rating(s):	Single-engine land; Single-engine sea; Multi-engine land	Seat Occupied:	Right
Other Aircraft Rating(s):	Glider; Helicopter	Restraint Used:	
Instrument Rating(s):	Airplane; Helicopter	Second Pilot Present:	Yes
Instructor Rating(s):	Airplane multi-engine; Glider; Helicopter; Instrument airplane	Toxicology Performed:	Yes
Medical Certification:	Class 1 With waivers/limitations	Last FAA Medical Exam:	May 25, 2007
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	
Flight Time:	28000 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	Registration:	N881CP
Model/Series:	T182T	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	
Airworthiness Certificate:	Normal	Serial Number:	182-08651
Landing Gear Type:	Tricycle	Seats:	4
Date/Type of Last Inspection:	September 10, 2007 Annual	Certified Max Gross Wt.:	3100 lbs
Time Since Last Inspection:	37.9 Hrs	Engines:	1 Reciprocating
Airframe Total Time:	300.8 Hrs as of last inspection	Engine Manufacturer:	Lycoming
ELT:	Installed, not activated	Engine Model/Series:	TIO-540
Registered Owner:		Rated Power:	235 Horsepower
Operator:		Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Night/dark
Observation Facility, Elevation:	LAS,2181 ft msl	Distance from Accident Site:	19 Nautical Miles
Observation Time:	18:56 Local	Direction from Accident Site:	68°
Lowest Cloud Condition:	Few / 11000 ft AGL	Visibility	10 miles
Lowest Ceiling:	Broken / 18000 ft AGL	Visibility (RVR):	
Wind Speed/Gusts:	3 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	240°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29.95 inches Hg	Temperature/Dew Point:	23° C / -1° C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Las Vegas, NV (VGT)	Type of Flight Plan Filed:	VFR
Destination:	Rosamond, CA (L00)	Type of Clearance:	VFR
Departure Time:	19:05 Local	Type of Airspace:	

Wreckage and Impact Information

Crew Injuries:	2 Fatal	Aircraft Damage:	Destroyed
Passenger Injuries:	N/A	Aircraft Fire:	On-ground
Ground Injuries:	N/A	Aircraft Explosion:	On-ground
Total Injuries:	2 Fatal	Latitude, Longitude:	35.959167,-115.493888

Administrative Information

Investigator In Charge (IIC):	Little, Thomas
Additional Participating Persons:	Leslie A Spahn; Federal Aviation Administration; Las Vegas, NV Henry J Soderlund; Cessna Aircraft Company; Wichita, KS Mark W Platt; Textron Lycoming; Williamsport, PA Colonel Lyle E Letteer; Civil Air Patrol; Dobbins AFB, GA Major James Grogan; United States Air Force; Beale Air Force Base, CA
Original Publish Date:	November 10, 2008
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=67063

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](#).