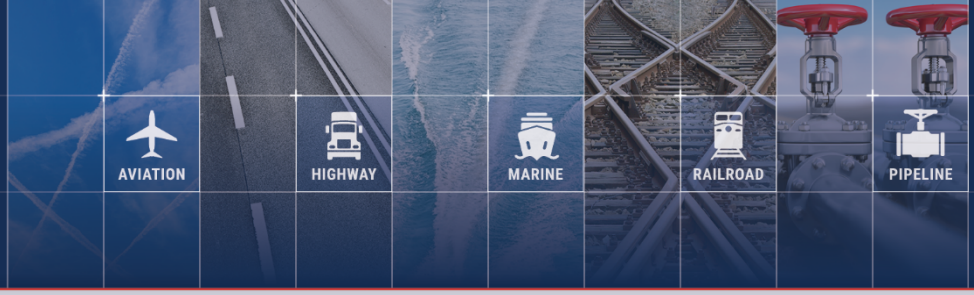


# Aviation Investigation Final Report

| | | | |
|---|---|---|---|
| **Location:** | SO. LAKE TAHOE, California | **Accident Number:** | LAX94FA318 |
| **Date & Time:** | August 11, 1994, 18:02 Local | **Registration:** | N217AF |
| **Aircraft:** | CESSNA 177RG | **Aircraft Damage:** | Destroyed |
| **Defining Event:** | | **Injuries:** | 4 Fatal |
| **Flight Conducted Under:** | Part 91: General aviation - Personal | | |

## Analysis

WHILE DEPARTING A HIGH DENSITY ALTITUDE AIRPORT AT A HIGH GROSS WEIGHT, THE AIRPLANE CLIMBED ABOUT 50 FEET AND DID NOT ACCELERATE. THE AIRPLANE WAS OBSERVED DESCENDING BEFORE COLLIDING WITH TREES ABOUT 1/2-MILE OFF THE DEPARTURE END OF THE RUNWAY. WEIGHT AND BALANCE COMPUTATIONS PLACED THE AIRPLANE OVER MAXIMUM ALLOWABLE GROSS WEIGHT. THE DENSITY ALTITUDE WAS COMPUTED AT 8,493 FEET ABOVE MEAN SEA LEVEL. THERE WAS NO EVIDENCE OF MECHANICAL FAILURE OR MALFUNCTION FOUND WITH THE AIRPLANE. THE DEPARTURE AIRPORT IS KNOWN FOR ITS HIGH DENSITY ALTITUDE AND DOWNDRAFTS AT THE END OF THE DEPARTURE RUNWAY. REVIEW OF THE PILOT'S FLIGHT EXPERIENCE REVEALED HE HAD OPERATED AT ONE HIGH DENSITY ALTITUDE AIRPORT IN THE PAST, WHERE HE ACCOMPLISHED ONE TAKEOFF AND LANDING WITH A FLIGHT INSTRUCTOR.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's decision to take off from a high density altitude airport at an over allowable gross weight condition. Factors in the accident were the high density altitude, down drafts, and the pilot's lack of familiarity operting from high density altitude airports.

### Findings

Occurrence #1: IN FLIGHT COLLISION WITH OBJECT
Phase of Operation: TAKEOFF - INITIAL CLIMB

Findings
1. (F) WEATHER CONDITION - HIGH DENSITY ALTITUDE
2. (F) WEATHER CONDITION - DOWNDRAFT
3. (C) PREFLIGHT PLANNING/PREPARATION - INADEQUATE - PILOT IN COMMAND
4. (C) AIRCRAFT WEIGHT AND BALANCE - EXCEEDED - PILOT IN COMMAND
5. (F) LACK OF FAMILIARITY WITH GEOGRAPHIC AREA - PILOT IN COMMAND
6. ALTITUDE - NOT ATTAINED - PILOT IN COMMAND
7. OBJECT - TREE(S)
---

Occurrence #2: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

## Factual Information

History of the Flight

On August 11, 1994, at 1802 hours Pacific daylight time, a Cessna 177RG, N217AF, collided with trees about 1/2 miles south of the departure end of runway 18 after takeoff from the South Lake Tahoe Airport, South Lake Tahoe, California. The airplane was operated by the Armed Forces Aero Club, San Diego, California, as a rental airplane. The airplane was destroyed by impact forces and post impact fire. The certificated private pilot and three passengers received fatal injuries. The flight was destined for Pine Mountain Lake Airport, Groveland, California. Visual meteorological conditions prevailed.

The airplane had departed the Pine Mountain Lake Airport earlier in the day arriving at South Lake Tahoe about 1545 hours. The airplane was serviced before departing the Pine Mountain Lake Airport with 35.3 gallons of 100LL octane aviation fuel. According to the servicing attendant, this brought the airplane's fuel quantity to a level about 1/2-inch below the top of the filler neck in the airplane's wings.

A line service attendant at the South Lake Tahoe Airport guided the Cessna 177RG to parking and talked to the pilot. The line service attendant told the pilot if he decided to take on fuel he should consider the density altitude because of the hot day. The pilot indicated to the attendant he was aware of the density altitude, and that after the takeoff on runway 18 he would make a left downwind departure. The attendant then informed the pilot that airplanes of that size and four persons onboard normally turn right and climb out over the golf course. The pilot indicated he also planned to depart about 1900 hours.

The South Lake Tahoe air traffic control tower cleared the airplane to taxi to runway 18 at 1752 hours. The airplane was cleared to takeoff at 1758 hours and was airborne at 1800 hours.

At 1800 hours the line attendant saw the airplane airborne at midfield, about 50 to 75 feet in the air. The line attendant told Safety Board investigators he was astonished at the slow airspeed of the plane and felt that the pilot was probably not going to make it. The line attendant continued to watch the airplane as headed south over the runway. He indicated the airplane's altitude appeared to get "lower and lower" until it went out of sight. The line attendant then observed a black plume of smoke emanating from the trees at the south end of the airport.

Pilot Information

The pilot held a private pilot certificate which was issued on October 3, 1993, with a single engine airplane rating. The pilot later added an airplane instrument rating on May 31, 1994.

The most recent second class medical certificate was issued to the pilot on August 13, 1993, with the issuance of a student pilot certificate.

According to the pilot's logbook, his total aeronautical experience consists of about 195 hours, of which about 18 hours were accrued in the Cessna 177RG. In the preceding 90 and 30 days before the accident, the logbook lists a total of 30 and 8 flight hours, respectively.

Review of the pilot's logbook revealed the pilot received 10 hours of instruction in the Cessna 177RG from June 12, 1994, to July 7, 1994. The only record of the pilot operating at an airport with a field elevation over 3,000 feet above sea level was on July 4, 1994. The pilot logbook reflects one takeoff and one landing at Tehachapi, California, (elevation 3,996 feet).

Aircraft Information

The airplane was manufactured on February 27, 1975, and had accumulated a total time in service of 7,848 hours. Examination of the maintenance records revealed that the most recent inspection, a 100-hour inspection, was accomplished on July 15, 1994, about 31 hours before the accident.

The Lycoming IO-360-A1B6 engine had accrued a total time in service of 2249 hours. The maintenance records note that a major overhaul was accomplished on October 20, 1992, about 788 hours before the accident.

The most recent weight and balance for the airplane was accomplished on February 23, 1993. The airplane certificated weight was listed at 1,854 pounds with a useful load of 946 pounds. The maximum gross weight for the airplane is 2,800 pounds. The moment of the airplane at the empty weight was listed at 192,057 inch/pounds.

The pilot's operating handbook for the Cessna 177RG indicates before "takeoff from short fields above 3,000 feet elevation the mixture should be leaned in accordance with the maximum power fuel flow placard located on the instrument panel control pedestal."

Meteorological Information

The closest official weather observation station is the South Lake Tahoe air traffic control tower. At 1802 hours, a special surface observation was reporting in part: sky condition and ceiling clear; visibility 50 statute miles; temperature 72 degrees Fahrenheit; dew point 42 degrees Fahrenheit; winds 240 degrees at 10 knots; altimeter 30.20" Hg. The density altitude at the time of the accident was computed at 8,493 feet msl.

Aerodrome and Ground Facilities

The Lake Tahoe Airport is owned and operated by the City of South Lake Tahoe. The published elevation of the airport 6,264 feet msl.

The airport has a single hard surfaced runway on a 360- to 180- degree magnetic orientation. Runway 18 is 8,544 feet long by 150 feet wide. The airport facility directory cautions pilots to the existence of down drafts close to mountains, and furthers states aircraft departing runway 18 frequently encounter down drafts.

The airport director also publishes a flyer which further cautions pilots to hazards associated with down drafts and high density altitude when operating from the airport. A copy of the flyer is attached to this report.

Wreckage and Impact Information

The initial impact was with the top of a pine tree about 52 feet above the ground. The airplane stuck the ground about 300 feet south of the tree and came to rest with the nose pointed north.

The engine compartment, cabin, and wings were destroyed by fire. Examination of the propeller exhibited chordwise scoring and leading edge nicks and gouges on all three blades. Examination of the engine did not reveal any evidence of mechanical failure or malfunction. The aluminum sheet metal of the wings was melted in the area of the fuel tanks.

The landing gear was found retracted in the wheel wells. The flap jack screw was found extended about 1.95 inches. According to the manufacturer, this measurement corresponds to a 10-degree flap extension. The stabilator trim actuator was found driven outside of its normal limits of travel.

The throttle, propeller control, and mixture control were found full forward. The mixture control knob shaft was bent 90 degrees at a point flush with its panel mounting. The fuel selector was found in the "BOTH" position.

Medical and Pathological Information

Post mortem examinations were conducted by the El Dorado County Coroner's Office. Specimens from the pilot were retained and sent to the Federal Aviation Administration's Civil Aeromedical Institute. The results of the toxicological analysis were negative for routine drug and alcohol screens.

Tests and Research

Airplane weight and Balance

The airplane's weight at the accident was computed using occupant weights obtained from the El Dorado County Sheriff/Coroners office, and an estimate of the baggage weight and fuel on board. The weights of the occupants were as follows: pilot - 235 pounds; right front passenger

- 155 pounds; rear seated passengers 100 pounds and 180 pounds; total passenger weight - 670 pounds. The baggage was estimated to be 20 pounds. The estimated weight of the fuel was based on 50 gallons remaining, or 300 pounds. The fuel remaining estimate was based on a direct flight from Pine Mountain Lake to Lake Tahoe at a airspeed of 155 MPH, and a fuel burn rate of 12 gallons per hour. The aircraft empty weight is 1,854 pounds; the weight of the airplane at takeoff from the Lake Tahoe Airport would be 2,844 pounds.

Additional Information

Wreckage Release

The wreckage was released to representatives of the owner on October 11, 1994.

## Pilot Information

| | | | |
|---|---|---|---|
| **Certificate:** | Private | **Age:** | 44,Male |
| **Airplane Rating(s):** | Single-engine land | **Seat Occupied:** | Left |
| **Other Aircraft Rating(s):** | None | **Restraint Used:** | |
| **Instrument Rating(s):** | Airplane | **Second Pilot Present:** | No |
| **Instructor Rating(s):** | None | **Toxicology Performed:** | Yes |
| **Medical Certification:** | Class 2 Valid Medical--no waivers/lim. | **Last FAA Medical Exam:** | August 13, 1993 |
| **Occupational Pilot:** | No | **Last Flight Review or Equivalent:** | |
| **Flight Time:** | 195 hours (Total, all aircraft), 18 hours (Total, this make and model), 170 hours (Pilot In Command, all aircraft), 30 hours (Last 90 days, all aircraft), 8 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft) | | |

## Aircraft and Owner/Operator Information

| | | | |
|---|---|---|---|
| **Aircraft Make:** | CESSNA | **Registration:** | N217AF |
| **Model/Series:** | 177RG 177RG | **Aircraft Category:** | Airplane |
| **Year of Manufacture:** | | **Amateur Built:** | |
| **Airworthiness Certificate:** | Normal | **Serial Number:** | 0717 |
| **Landing Gear Type:** | Retractable - Tricycle | **Seats:** | 4 |
| **Date/Type of Last Inspection:** | July 15, 1994 100 hour | **Certified Max Gross Wt.:** | 2800 lbs |
| **Time Since Last Inspection:** | 31 Hrs | **Engines:** | 1 Reciprocating |
| **Airframe Total Time:** | 7848 Hrs | **Engine Manufacturer:** | LYCOMING |
| **ELT:** | Installed, not activated | **Engine Model/Series:** | IO-360-A1B6 |
| **Registered Owner:** | ARMED FORCES AERO CLUB | **Rated Power:** | 200 Horsepower |
| **Operator:** | | **Operating Certificate(s) Held:** | None |
| **Operator Does Business As:** | | **Operator Designator Code:** | |

## Meteorological Information and Flight Plan

| | | | |
|---|---|---|---|
| **Conditions at Accident Site:** | Visual (VMC) | **Condition of Light:** | Day |
| **Observation Facility, Elevation:** | TVL ,6264 ft msl | **Distance from Accident Site:** | 1 Nautical Miles |
| **Observation Time:** | 18:02 Local | **Direction from Accident Site:** | 360° |
| **Lowest Cloud Condition:** | Clear | **Visibility** | 50 miles |
| **Lowest Ceiling:** | None | **Visibility (RVR):** | |
| **Wind Speed/Gusts:** | 10 knots / | **Turbulence Type Forecast/Actual:** | / |
| **Wind Direction:** | 240° | **Turbulence Severity Forecast/Actual:** | / |
| **Altimeter Setting:** | 30 inches Hg | **Temperature/Dew Point:** | 24°C / 6°C |
| **Precipitation and Obscuration:** | No Obscuration; No Precipitation | | |
| **Departure Point:** | | **Type of Flight Plan Filed:** | None |
| **Destination:** | GROVELAND , CA (Q68 ) | **Type of Clearance:** | None |
| **Departure Time:** | 00:00 Local | **Type of Airspace:** | Class D |

## Airport Information

| | | | |
|---|---|---|---|
| **Airport:** | LAKE TAHOE TVL | **Runway Surface Type:** | Asphalt |
| **Airport Elevation:** | 6264 ft msl | **Runway Surface Condition:** | Dry |
| **Runway Used:** | 18 | **IFR Approach:** | None |
| **Runway Length/Width:** | 8544 ft / 150 ft | **VFR Approach/Landing:** | None |

## Wreckage and Impact Information

| | | | |
|---|---|---|---|
| **Crew Injuries:** | 1 Fatal | **Aircraft Damage:** | Destroyed |
| **Passenger Injuries:** | 3 Fatal | **Aircraft Fire:** | On-ground |
| **Ground Injuries:** | N/A | **Aircraft Explosion:** | None |
| **Total Injuries:** | 4 Fatal | **Latitude, Longitude:** | 38.840591,-120.010093(est) |

## Administrative Information

| | |
|---|---|
| **Investigator In Charge (IIC):** | Wilcox, Thomas |
| **Additional Participating Persons:** | CHARLES R LITTLE; WILLIAMSPORT , PA<br>JOHN HUY; WICHITA , KS<br>A. C EDMONSON; SAN DIEGO , CA<br>REID WALBURG; RENO , NV |
| **Original Publish Date:** | January 19, 1996 |
| **Last Revision Date:** | |
| **Investigation Class:** | Class |
| **Note:** | |
| **Investigation Docket:** | https://data.ntsb.gov/Docket?ProjectID=28547 |