



National Transportation Safety Board Aviation Accident Final Report

Location:	SAN JOSE, CA	Accident Number:	LAX96FA078
Date & Time:	12/23/1995, 0019 PST	Registration:	N27954
Aircraft:	Piper PA-31-350	Aircraft Damage:	Destroyed
Defining Event:		Injuries:	2 Fatal

Flight Conducted Under: Part 91: General Aviation - Instructional

Analysis

The aircraft impacted mountainous terrain in controlled flight during hours of darkness and marginal VFR conditions. The flight was being vectored for an instrument approach during the pilot's 14 CFR Part 135 instrument competency check flight. The flight was instructed by approach control to maintain VFR conditions, and was assigned a heading and altitude to fly which caused the aircraft to fly into another airspace sector below the minimum vectoring altitude (MVA). FAA Order 7110.65, Section 5-6-1, requires that if a VFR aircraft is assigned both a heading and altitude simultaneously, the altitude must be at or above the MVA. The controller did not issue a safety alert, and in an interview, said he was not concerned when the flight approached an area of higher minimum vectoring altitudes (MVA's) because the flight was VFR and 'pilots fly VFR below the MVA every day.' At the time of the accident, the controller was working six arrival sectors and experienced a surge of arriving aircraft. The approach control facility supervisor was monitoring the controller and did not detect and correct the vector below the MVA.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The failure of the air traffic controller to comply with instructions contained in the Air Traffic Control Handbook, FAA Order 7110.65, which resulted in the flight being vectored at an altitude below the minimum vectoring altitude (MVA) and failure to issue a safety advisory. In addition, the controller's supervisor monitoring the controller's actions failed to detect and correct the vector below the MVA. A factor in the accident was the flightcrew's failure to maintain situational awareness of nearby terrain and failure to challenge the controller's instructions.

Findings

Occurrence #1: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: APPROACH

Findings

1. TERRAIN CONDITION - MOUNTAINOUS/HILLY
2. LIGHT CONDITION - DARK NIGHT
3. (C) INSTRUCTIONS, WRITTEN/VERBAL - NOT FOLLOWED - ATC PERSONNEL(DEP/APCH)
4. (C) SAFETY ADVISORY - NOT ISSUED - ATC PERSONNEL(DEP/APCH)
5. (C) SUPERVISION - INADEQUATE - ATC PERSONNEL(SUPERVISOR)
6. (F) UNSAFE/HAZARDOUS CONDITION - NOT UNDERSTOOD - CHECK PILOT

Factual Information

HISTORY OF FLIGHT

On December 23, 1995, at 0019 hours Pacific standard time, a Piper PA-31, N27954, impacted terrain 16 miles north-northeast of San Jose, California. The aircraft was destroyed and the two pilots were fatally injured. The flight, operated by Ameriflight, Inc., with call sign "Amflight 41", was an instructional flight conducted under 14 CFR Part 91. An IFR flight plan was filed and the flight completed two IFR and two VFR segments prior to the accident. The flight was operating under visual flight rules at the time of the accident. Weather conditions at the accident location are unknown; however, visual meteorological conditions prevailed at Oakland. The flight departed from Oakland at 2320.

The purpose of the flight was to conduct a 6-month instrument proficiency check for the second pilot. The other pilot was a check airman employed by the operator. In accordance with the operators Operations Manual, the check airman was the designated pilot-in-command (PIC).

After an IFR departure from Oakland, the flight completed two ILS approaches back to the Oakland airport before requesting vectors for approach to Hayward. The first ILS was terminated in a VFR missed approach which was followed by radar vectors from Bay TRACON for the second (IFR) ILS approach at Oakland. The second ILS approach also terminated with a VFR missed approach from Oakland to the east. Oakland Tower personnel inhibited the Minimum Safe Altitude Warning (MSAW) system for the flight when it initiated the VFR missed approach. The pilot then contacted Bay TRACON and requested a localizer DME runway 28L approach to the Hayward airport. After determining the aircraft's heading, Bay TRACON controllers instructed the aircraft to maintain 3,000 feet and then, 4 minutes later, instructed the aircraft to fly heading 120 degrees (downwind leg) and maintain VFR conditions. The pilot acknowledged the heading assignment but not "maintain VFR." Five minutes later, the pilot asked the controller if they could turn onto the localizer and was told that there were two Oakland arrivals inbound and that the turn would be issued in "just a couple more seconds." Four minutes later, radar contact was lost with the aircraft.

Rescue helicopters received an emergency locator beacon signal in the area where radar contact was lost, but were initially unable to locate the aircraft due to low clouds obscuring the mountains. The wreckage was located at 0915 when the weather improved. The aircraft had impacted a north facing mountain slope at the 3,000-foot elevation level.

PERSONNEL INFORMATION

The PIC/check airman was hired by Ameriflight, Inc., on July 5, 1994, and held an Airline Transport Pilot license with a multiengine land rating and commercial privileges in single engine land airplanes. He was authorized by the operator to act as PIC of Piper PA-32R, Piper PA-31, and Beech BE-99 aircraft under day or night and VFR or IFR conditions. At the time of the accident he had acquired total flying time of approximately 4,500 hours, of which approximately 1,200 hours were in multiengine aircraft. He held a valid first-class airman's medical certificate with no waivers or limitations.

In the 7-day period before the accident the pilot had flown a total of 14.1 hours. The first 2 days were off-duty (Saturday and Sunday), followed by 5 workdays. The first 3 workdays (Monday to Wednesday), the pilot's schedule consisted of reporting for work at Oakland early in the

morning, flying an outbound Piper PA-31 trip of around 2 hours duration, being off-duty at the outbound station through the day (rest time), and returning to the home base in the early evening. The fourth workday (Thursday), the pilot reported for duty (at Oakland) at 0100, departed on an outbound Beech BE-99 trip at 0300, turned around at the outlying station, returned to Oakland and was off-duty at 0700.

The 5th workday, the day of the accident, the pilot reported for duty at Oakland at 0600 hours, flew an outbound trip in a PA-31 and was off-duty at the outbound station (Eureka, California) at 0900 hours. He departed the outbound station at 2030 hours and returned to his Oakland base at 2300 hours. The pilot then departed on the accident flight at approximately 2330 hours. The hours between 0900 and 2030 were off-duty (rest time), however, it was reported by the operator that the pilot used the time to return to Oakland (deadhead) on another Ameriflight aircraft for undetermined personal reasons.

The pilot's fiancée reported that he was very upbeat and happy about prospects for the future. He liked his job and had recruited several of his friends to Ameriflight. She reported that on Thursday, the day before the accident, he slept from about 1000 to 1400 hours after returning home from his early morning flight. He went to bed again at 2200 hours and was out of the house at 0445 Friday morning. After flying his outbound leg to Eureka in the morning he was supposed to meet the second pilot there to complete the check ride, however, the second pilot had called in ill. The pilot then deadheaded back to Oakland for undetermined reasons before returning to Eureka for his return flight. The pilot's fiancée didn't know of any sleep he got through the day, but doubted he was fatigued because of excellent sleep the previous day and his good health and stamina.

The second pilot was hired by Ameriflight, Inc., on January 4, 1993, and held an Airline Transport Pilot license with a multiengine land airplane rating and commercial privileges in single engine land airplanes. He was approved by the operator to serve as PIC of Piper PA-32R, Piper PA-31, and Beech BE-99 aircraft. He had accumulated a total flying time of approximately 5,150 hours, of which approximately 2,500 hours were in multiengine aircraft.

In the 7-day period before the accident the second pilot had flown a total of 13.1 hours. The first 2 days were off-duty (Saturday and Sunday), followed by 5 workdays. On the first 4 workdays (Monday through Thursday), his schedule each day consisted of a morning outbound flight from Oakland to Eureka, California, arriving about 0930 hours. He was off-duty in Eureka until 1830 hours, and then made a return flight to Oakland with stops in Ukiah and Sacramento, California. He was off-duty in Oakland about 2230 hours each night. On Friday, December 22, he was scheduled to fly the same trip, however, he called in sick and did not fly until the accident flight.

The second pilot's wife reported that he had called in sick due to cold symptoms, and that he remained at home during the day Friday while she worked. She did not know if he took any medication. When she returned home in the evening they had dinner together and she reported that he seemed rested and alert, and showed no signs of having a cold. She said that he was very happy and content, liked his job, and was eager to complete his check ride in anticipation of spending the weekend with his family.

Another Ameriflight pilot talked with the pilots about 2300 hours Friday evening as they were preparing to go to the aircraft. He reported that they both seemed rested and alert and that neither pilot showed any signs of illness. This pilot had known the PIC a long time and

considered him a very good airman and said that he knew what the clearance phrase "maintain VFR" meant.

AIRCRAFT INFORMATION

The aircraft was acquired by Ameriflight in July 1994, and at the time of the accident had acquired 9,840 hours total time and 10,966 cycles. The aircraft was maintained by the operator in accordance with their FAA approved continuous airworthiness inspection program. The inspection program consists of four inspection events at 100-hour intervals. The most recent maintenance was an event three inspection on December 19, 1995, at 9,828 hours. The aircraft was dispatched for the accident flight with no deferred maintenance items (squawks).

METEOROLOGICAL CONDITIONS

Weather conditions in the San Francisco Bay area at the time of the accident consisted of multiple scattered to broken stratus layers, bases 1,000 to 3,000 feet, with tops to 6,000 feet. No weather reports are available in the mountains near the accident site; however, 30 minutes prior to the accident, the weather at San Jose, 14 miles south-southwest was: sky partially obscured, 1,100 foot scattered clouds, measured 2,000 foot overcast clouds, visibility 8 miles and wind calm. At Oakland, 25 miles west, the estimated ceiling was 1,500 foot broken, 6,500 foot overcast, visibility 5 miles in fog with a 2-degree temperature/dew point spread. The wind was northeasterly at 11 knots. Another Ameriflight pilot who was inbound to Oakland from Sacramento heard AMFLT 41 on the radio shortly before the accident. He described the night as "kind of an ugly night" with multiple stratus layers and some mountains obscured. Although he could have flown VFR, he opted to file IFR and reported that the mountains were obscured near SUNOL intersection.

COMMUNICATIONS

In the 12 minutes before the accident the aircraft was in radio and radar contact with Bay TRACON. There were two controllers and one supervisor present in the TRACON which was combined into two sectors each staffed by one of the controllers. Departure radars 1, 2, and 3, and arrival radars 7, 8, and 12 were combined at arrival radar 5. The accident aircraft was in communication with arrival radar 6 which had combined arrival radars 1, 2, 3, 4, 9 and 10, as well as flight data positions 1 and 2.

The controller at arrival radar 6 was a full performance level controller. He has 11 years experience as a controller, all in terminal air traffic control, and the last 7 years exclusively in radar control of aircraft. He completed mid-shift qualification training, which is required to work the late night combined sector configuration, on April 14, 1995.

In the 4-day period before the accident the controller worked five shifts. On Tuesday, December 19, he worked a shift from 1500 to 2300 hours. On Wednesday and Thursday, December 20 and 21, his shift was from 1330 to 2130 each day. On Friday, December 22, he worked from 0625 until 1425, and was off-duty until 2235. He then worked 2235 to 0635 (Saturday morning, December 23). The accident occurred at 0019 Saturday morning. The controller reported that this was not an abnormal work schedule, and said that he slept during the time off Friday afternoon and was rested when he reported for work Friday evening.

The controller told the NTSB investigator that there were several indications to him that the aircraft was VFR when it departed Oakland after the second ILS approach. One was that the aircraft was handed off directly to him by the tower instead of a departure controller as it

would have had it been IFR. Another indication was that the aircraft was flying heading 080 degrees (a VFR heading) instead of flying runway heading as it would have under IFR. A third indication was the aircraft's data block which carried a "R" symbol indicating that the aircraft was conducting VFR practice approaches.

In the 4 minutes before the accident a surge of IFR arrival traffic into San Francisco and Oakland required that the controller delay AMFLT 41's approach to Hayward. The controller characterized the workload as "quite heavy" but within his ability to routinely handle. The controller told the NTSB investigator that it is a routine, workload leveling, practice in this situation to delay handling aircraft that are VFR awaiting approaches and give priority to aircraft on IFR flight plans. In the controller's view, AMFLT 41 was clearly VFR and was responsible for its own terrain separation. The controller stated he was not concerned when AMFLT 41 approached an area of higher minimum vectoring altitudes (MVA's) because "VFR aircraft fly below MVA's every day."

The supervisor on duty at Bay TRACON at the time of the accident told the NTSB investigator that staffing levels at the facility are set based upon past experience, and that the controllers assigned to work the shift on which the accident occurred were present. The supervisor stated that during the traffic surge in the minutes preceding the accident, he was seated at the radar display between the two controllers on duty. He stated that the controller handled the traffic surge routinely and that he (the supervisor) was aware of AMFLT 41.

WRECKAGE AND IMPACT INFORMATION

The wreckage was located at the 3,000-foot elevation of a north facing mountain slope at latitude 37 degrees, 32 minutes north and longitude 121 degrees, 44 minutes west. A higher ridge reaches 3,718 feet 2 miles southeast of the accident site. Radar data obtained from Bay TRACON shows the aircraft tracking 120 degrees at 3,000 feet altitude prior to the accident. The aircraft impacted the mountain with landing gear and flaps retracted.

The accident site is in an area of 50- to 75-foot-tall trees growing on a mountain slope of approximately 35 degrees. The aircraft impacted in the top of the trees and then continued approximately 120 feet to the main impact point. The left and right wing tips were located approximately 50 feet along the wreckage path from the point of initial contact with the treetops. The fuselage and wing center section including engine nacelles were found at the main impact point.

The left and right engines were separated from the aircraft and were approximately 24 and 34 feet respectively, upslope of the main wreckage and 19 and 3 degrees respectively, left of the wreckage centerline. The propellers were both separated from their respective engines with the left propeller located under the left engine nacelle near the fuselage and the right propeller located in a small tree approximately 14 feet upslope of the right engine.

Between the initial impact point and the main wreckage were vegetation debris and small pieces of the aircraft, principally pieces of the wing's outer panels and control surfaces. All major assemblies of the aircraft were present at the accident site. The aircraft burned after impact and the cockpit and fuselage forward of the wing trailing edge were destroyed. The engines, separated from the aircraft, were involved in the ground fire.

MEDICAL AND PATHOLOGICAL INFORMATION

Autopsies were performed on both pilots by the Alameda County Sheriff's Department

Coroner's Bureau. Toxicological tests were performed on both pilots by the FAA's Civil Aeromedical Institute in Oklahoma City, Oklahoma. The pilot's toxicology test was negative for drugs; however, tests for carbon monoxide, cyanide, and volatiles could not be performed due to the lack of a suitable specimen.

The second pilot's toxicology test was negative for cyanide and volatiles. No analysis for carbon monoxide was performed due to lack of a suitable specimen. The test was positive for four drugs: Pseudoephedrine was detected in the urine and blood, and Phenylpropanolamine was detected in the urine. Salicylate and Acetaminophen were detected in measurable quantities in the urine.

ADDITIONAL INFORMATION

Pilot and Air Traffic Controller roles in terrain separation are addressed in the Air Traffic Controller's Handbook, FAA Order 7110.65J and the Aeronautical information Manual (AIM).

The Air Traffic Controller's Handbook states in Chapter 2, paragraph 2-1-2. Duty Priority, that the controller shall "Give first priority to separating aircraft and issuing safety alerts as required in this order." In paragraph 2-1-6. Safety Alert, the same order states that the air traffic controller shall "Issue a safety alert to an aircraft if you are aware the aircraft is at an altitude which, in your judgment, places it in unsafe proximity to terrain, obstructions, or other aircraft....NOTE:While a controller cannot see immediately the development of every situation where a safety alert must be issued, the controller must remain vigilant for such situations and issue a safety alert when the situation is recognized." The handbook further states in paragraph 2-1-6, "Do not assume that because someone else has responsibility for the aircraft that the unsafe situation has been observed and the safety alert issued; inform the appropriate controller."

The Aeronautical Information Manual (AIM) states in section 3-2-1, paragraph f, Safety Alerts, that "Safety Alerts are mandatory services and are provided to ALL aircraft." In sub-paragraph 1. of that paragraph is further stated "A Terrain/Obstruction Alert is issued when, in the controller's judgment, an aircraft's altitude places it in unsafe proximity to terrain and/or obstructions." In section 4-1-15. Safety Alert, paragraph a.1. of the AIM states that "Controllers will immediately issue an alert to the pilot of an aircraft under their control when they recognize that the aircraft is at an altitude which, in their judgment, may be in an unsafe proximity to terrain\obstructions." In section 4-1-16. Radar Assistance to VFR Aircraft, paragraph b., the AIM states that "Pilots should clearly understand that authorization to proceed in accordance with such radar navigational assistance does not constitute authorization for the pilot to violate FARs." Paragraph c. of the same section states "In many cases, controllers will be unable to determine if flight into instrument conditions will result from their instructions. To avoid possible hazards resulting from being vectored into IFR conditions pilots should keep controllers advised of the weather conditions in which they are operating and along the course ahead."

The Aeronautical Information Manual, Paragraph 5-4-3, "Approach Control," states in part, "(b)...Radar vectors and altitude or Flight Levels will be issued as required for spacing and separating aircraft. Therefore, pilots must not deviate from the headings issued by approach control." The AIM states further in Chapter 5, "Air Traffic Procedures," Section 4, "Arrival Procedures," paragraph 5-4-5, "Instrument Approach Procedure Charts," in part: "d. Minimum Vectoring Altitudes (MVA) are established for use by ATC when radar ATC is

exercised....1. The minimum vectoring altitude in each sector provides 2,000 feet above the highest obstacle in designated mountainous areas....2....While being radar vectored IFR altitude assignments by ATC will be at or above MVA."

Also in Chapter 5 of the AIM, Pilot/Controller Roles and Responsibilities, Section 5-5-6. Radar Vectors, lists among pilot responsibilities in a.3: "If operating VFR and compliance with any radar vector or altitude would cause a violation of an FAR, advises ATC and obtains a revised clearance or instructions." In section 5-5-7. Safety Alert, among pilot responsibilities are "Be aware that this service is not always available and that many factors affect the ability of the controller to be aware of a situation in which unsafe proximity to terrain, obstructions, or another aircraft may be developing."

The NTSB asked the FAA Western Region to interpret a note in section 5-6-1 of the Air Traffic Control Handbook, FAA Order 7110.65(). The question from the NTSB to the FAA was:

"In [Order 7110.65()], a note appended to section 5-6-1, Paragraph (c), states that the controller may vector a VFR aircraft at any altitude (i.e. below the MVA) if the aircraft is 'not at an altitude assigned by ATC'. Does the reverse apply? Specifically, if the VFR aircraft is at an altitude assigned by ATC, may the controller vector the aircraft in Class E airspace at an altitude which is below the MVA?"

The FAA (Acting Manager, Strategic Operations. and Procedures, ATO-100) replied:

"The basic answer is no, if a controller assigns an altitude to maintain to any aircraft, whether operating Instrument Flight Rules (IFR) or VFR, the altitudes specified in paragraph 5-6-1, Methods, are applicable.

Simply stated the intent of the requirements of Order 7110.65 are that a controller may assign an altitude or a vector to a VFR aircraft at any time, but to assign both simultaneously, the aircraft must be at or above the MVA/MIA (minimum IFR altitude), as per paragraph 5-6-1."

The NTSB released the aircraft wreckage to United States Aviation Insurance Group on April 11, 1996.

Additional persons participating in this accident investigation were:

John W. Hazlet, Jr., Kenneth J. Couche, and Stuart R. Schrock of Ameriflight, Inc., Burbank, CA 91505.

Pilot Information

Certificate:	Airline Transport	Age:	36, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Seat Occupied:	Right
Other Aircraft Rating(s):	None	Restraint Used:	
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	Airplane Multi-engine; Airplane Single-engine; Instrument Airplane	Toxicology Performed:	Yes
Medical Certification:	Class 1 Valid Medical--no waivers/lim.	Last FAA Medical Exam:	08/03/1995
Occupational Pilot:		Last Flight Review or Equivalent:	
Flight Time:	4659 hours (Total, all aircraft), 914 hours (Total, this make and model), 4593 hours (Pilot In Command, all aircraft), 216 hours (Last 90 days, all aircraft), 78 hours (Last 30 days, all aircraft), 4 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	Registration:	N27954
Model/Series:	PA-31-350 PA-31-350	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	31-7952062
Landing Gear Type:	Retractable - Tricycle	Seats:	2
Date/Type of Last Inspection:	12/19/1995, Continuous Airworthiness	Certified Max Gross Wt.:	7000 lbs
Time Since Last Inspection:	12 Hours	Engines:	2 Reciprocating
Airframe Total Time:	9840 Hours	Engine Manufacturer:	Lycoming
ELT:	Installed, activated, aided in locating accident	Engine Model/Series:	TIO-540-J2BD
Registered Owner:	AMERIFLIGHT, INC.	Rated Power:	350 hp
Operator:	AMERIFLIGHT, INC.	Operating Certificate(s) Held:	On-demand Air Taxi (135)
Operator Does Business As:		Operator Designator Code:	JIKA

Meteorological Information and Flight Plan

Conditions at Accident Site:	Unknown	Condition of Light:	Night/Dark
Observation Facility, Elevation:	OAK, 6 ft msl	Distance from Accident Site:	25 Nautical Miles
Observation Time:	2359 PST	Direction from Accident Site:	275°
Lowest Cloud Condition:	Unknown / 0 ft agl	Visibility	5 Miles
Lowest Ceiling:	Broken / 1500 ft agl	Visibility (RVR):	0 ft
Wind Speed/Gusts:	11 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	40°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30 inches Hg	Temperature/Dew Point:	8° C / 7° C
Precipitation and Obscuration:			
Departure Point:	OAKLAND, CA (OAK)	Type of Flight Plan Filed:	IFR
Destination:		Type of Clearance:	VFR; VFR on top
Departure Time:	2320 PST	Type of Airspace:	Class E

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:	None
Total Injuries:	2 Fatal	Latitude, Longitude:	

Administrative Information

Investigator In Charge (IIC):	RICHARD B PARKER	Report Date:	03/31/1997
Additional Participating Persons:	EGONS KNETS; OAKLAND, CA CHARLES R LITTLE; VERO BEACH, FL MARK W PLATT; WILLIAMSPORT, PA CHARLES R MOTE, JR.; SAN DIEGO, CA		
Publish Date:			
Investigation Docket:	NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at pubinq@ntsb.gov , or at 800-877-6799. Dockets released after this date are available at http://dms.nts.gov/pubdms/ .		

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](#).