Aviation Investigation Final Report

Location:	CLE ELUM, Washington	**Accident Number:**	SEA97FA006
Date & Time:	October 8, 1996, 03:26 Local	**Registration:**	N666HL
Aircraft:	Piper PA-34-200T	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	1 Fatal
Flight Conducted Under:	Part 135: Air taxi & commuter - Non-scheduled		

Analysis

The pilot went to a doctor 6 hours before reporting to fly, and was diagnosed with gastritis, reflux symptoms, and fatigue. Just before taking off on the accident flight, the pilot complained to a fellow company pilot that he felt ill, expressing fear of repercussions from his company if he grounded himself. A few minutes before disappearing from contact with air traffic control, he radioed the fellow pilot (who was in another company aircraft on the same route): 'I don't feel so good...I feel like I'm going to toss my cookies.' The aircraft wreckage was located about 11 hours after the disappearance, with the pilot fatally injured inside. Wreckage distribution at the accident site was indicative of inflight separation of the right wing and horizontal stabilator. Subsequent examination indicated that the wing and stabilator separations were a result of overstress. No evidence of mechanical problems was noted, other than the separated wing and stabilator. In constructing a history of the pilot's activities before the accident, investigators found that his activities for the two days before the accident (during a rest period) were on a schedule inconsistent with his night air cargo duties.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's physical impairment of judgment and performance, his decision to fly while impaired, and his subsequent failure to maintain control of the aircraft which led to the aircraft's design stress limits being exceeded and inflight separation of the horizontal stabiliator and right wing. Contributing to the accident were: pilot fatigue and self-induced pressure to fly.

Findings

Occurrence #1: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: CRUISE

Findings
1. (C) AIRCRAFT CONTROL - NOT MAINTAINED - PILOT IN COMMAND
2. (C) PHYSICAL IMPAIRMENT - PILOT IN COMMAND
3. (C) IMPROPER DECISION - PILOT IN COMMAND
4. (F) FATIGUE - PILOT IN COMMAND
5. (F) SELF-INDUCED PRESSURE - PILOT IN COMMAND

Occurrence #2: AIRFRAME/COMPONENT/SYSTEM FAILURE/MALFUNCTION
Phase of Operation: DESCENT - UNCONTROLLED

Findings
6. (C) DESIGN STRESS LIMITS OF AIRCRAFT - EXCEEDED - PILOT IN COMMAND
7. HORIZONTAL STABILIZER - OVERLOAD
8. HORIZONTAL STABILIZER - SEPARATION
9. WING - OVERLOAD
10. WING - SEPARATION

Occurrence #3: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

Factual Information

HISTORY OF FLIGHT

On October 8, 1996, approximately 0326 Pacific daylight time, Seattle Air Route Traffic Control Center (ARTCC) lost radio and radar contact with AIRPAC Airlines Flight 72 (N666HL), a Piper PA-34-200T operating on a 14 CFR 135 non-scheduled domestic cargo flight from Spokane International Airport, Spokane, Washington, to Boeing Field, Seattle, Washington. The last contact with the aircraft was reported to be approximately 61 nautical miles east of Seattle. The aircraft was on an instrument flight rules (IFR) flight plan; however, visual meteorological conditions were reported at Wenatchee and Yakima, Washington, the closest weather reporting stations. The substantially damaged aircraft wreckage was located approximately 3 miles southeast of Cle Elum, Washington by air search and rescue personnel of the Washington State Department of Aeronautics at approximately 1425. The commercial pilot, the airplane's sole occupant, was found by ground rescue personnel to have been fatally injured.

AIRPAC Flight 72 was the second leg of a two-leg trip, consisting of flight from Boeing Field to Spokane and return to Boeing Field. According to trip logs recovered from the aircraft wreckage, AIRPAC flight 48, the Boeing Field-Spokane outbound leg, had a start-duty time of 2300 on the evening of October 7, departed Boeing Field on schedule at 2345 on October 7 and arrived in Spokane on schedule at 0120 on October 8. AIRPAC 72, the return flight on which the accident occurred, had a start-duty time at Spokane of 0130, and departed Spokane on schedule at 0215. It was scheduled to arrive at Boeing Field at 0400. The filed route of flight was the V2 Federal airway from Spokane to Seattle VORTAC, and thence to Boeing Field.

Another AIRPAC pilot, who flew a separate AIRPAC flight from Spokane to Seattle on the night of the accident, reported that in a conversation with the accident pilot while on the ground at Spokane, the accident pilot complained of feeling ill. This pilot stated that when he asked the accident pilot why he had come to work if he was feeling ill, the accident pilot expressed a belief that he would get into trouble if he did not show up to fly. The fellow AIRPAC pilot also reported that during Flight 72's trip, his (the fellow pilot's) flight was approximately 10 miles ahead of Flight 72 and that he was in radio contact with the accident pilot on a company frequency. This pilot stated that shortly before the loss of contact, the accident pilot radioed to him: "I don't feel so good....I feel like I'm going to toss my cookies."

According to FAA air traffic control (ATC) records, the last confirmed radio contact between AIRPAC 72 and Seattle ARTCC was when AIRPAC 72 checked onto the Seattle sector 2 frequency at 9,000 feet, at 0311:55. The pilot of AIRPAC 72 was also possibly heard on the Seattle sector 2 frequency at 0312:35, saying "yea nine point six behind you", and again (possibly) at 0315:08 saying "wait." At 0323:54, the sector 2 radar controller advised AIRPAC

72 that radar contact had been lost and issued instructions for AIRPAC 72 to report when 45 miles east of Seattle. AIRPAC 72 did not reply to this call, according to the ATC transcript. The sector 2 radar controller repeated the loss of radar contact and the instruction twice more to AIRPAC 72, at 0326:30 and again at 0326:46, both times without reply. The controller subsequently made repeated attempts to contact AIRPAC 72, all without success. When AIRPAC 72 could not be contacted or located after repeated attempts, missing aircraft procedures were initiated.

The loss of contact with ATC took place in an area of limited ATC radar coverage. ATC controllers on duty in Seattle ARTCC at the time of the loss of contact characterized the loss of radar contact with AIRPAC 72 as occurring at a normal location for the route and altitude of flight. Over 90 seconds elapsed between the next-to-last position recorded on radar and the aircraft's final positive radar return. The aircraft's last radar position, recorded at 0324:46, was approximately one mile west of the crash site at an altitude of 8,900 feet (100 feet below the aircraft's assigned altitude.) A plot of the 0324:46 radar return position onto a Seattle sectional chart showed the aircraft to be approximately on course at that time. The radar target went into "coast" mode at 0326:05.

The accident occurred during the hours of darkness at approximately 47 degrees 9 minutes North and 120 degrees 54 minutes West.

PERSONNEL INFORMATION

The 33-year-old pilot was hired by AIRPAC on June 5, 1996, approximately four months prior to the accident. His company flight time and duty records, and his pilot logbook, indicated that prior to the accident, his last AIRPAC flight was on October 4, 1996. Company flight time and duty records indicated that for the previous two weeks, the pilot's duty cycle at AIRPAC started consistently at 2300, with the last flight of the duty cycle ending between approximately 0330 and 0410. The pilot typically entered standby status at 0515, but had not flown during a standby period since September 19, 1996. The pilot's standby periods in the previous two weeks ended between 0545 and 0705, with the majority of those ending just after 0600. As of October 4, 1996, the pilot had logged 183.9 hours year-to-date, 11.5 hours month-to-date, 13.0 hours in the past week, and 3.3 hours in the past 24 hours, according to company records.

Investigators reconstructed a history of the pilot's known activities during the period between duty-end at 0515 on Friday, October 4 and duty-start at 2300 on Monday, October 7, a period during which the pilot did not perform any duties with AIRPAC. While investigators were unable to obtain any information pertaining to the pilot's activities after end-duty on Friday, October 4 or at any time during Saturday, October 5, findings were made with respect to the accident pilot's activities on Sunday, October 6 as well as to before duty-start on Monday, October 7 (the night of the accident trip.)

The accident pilot was a naval reservist and a rated Naval Flight Officer (NFO). According to a safety officer in his naval reserve unit, he flew as a tactical coordinator (TACCO-a mission crew

position) on the Lockheed P-3 Orion antisubmarine warfare (ASW) patrol aircraft. On Sunday, October 6, the accident pilot performed naval reserve duty at Naval Air Station (NAS) Whidbey Island, Washington. According to an activity history prepared by safety personnel in the pilot's naval reserve unit, the pilot departed his home of Issaquah, Washington, in his personal car at approximately 0530 Sunday morning for NAS Whidbey Island (a driving distance of approximately 95 miles from Issaquah), arriving there at approximately 0730 and starting duty at that time. The accident pilot's duties consisted of an aircraft preflight, an intelligence briefing, lunch from 1100 to 1230, "general NFO discussions in [the] wardroom" from 1230 to 1500, aircraft preflight from 1500 to 1615, and a 1-hour local P-3 flight from 1615 to 1715. The accident pilot then drove home to Issaquah, departing approximately 1715 and arriving at approximately 1915.

Personnel from the pilot's naval reserve unit, and staff at Galvin Flying Service of Boeing Field (where the pilot gave flight instruction on an occasional basis), furnished additional information indicating that at about 0645 on the morning of Monday, October 7, the pilot was at Galvin Flying Service to give simulator instruction to a friend. The instructional period began at about 0715. The simulator student reported that when they encountered mechanical problems with the simulator, they remained there to troubleshoot the device until the student departed at about 0830 for another appointment. The student reported that the accident pilot remained at Galvin Flying Service to continue troubleshooting the simulator at that time, and that the pilot "was also looking for a flight manual." The simulator student further indicated that he again saw the accident pilot at Simulator Training, Incorporated (a simulator training firm located near Seattle-Tacoma International Airport) at about 0930.

The pilot's personal physician furnished an appointment record which indicated that at 1700 on October 7, six hours prior to starting duty at AIRPAC on the accident trip, the pilot came in to see the physician complaining of "recent epigastric distress" and "intense pain...in his right lower pectoral area...." The record of the visit went on to indicate: "...he has not been able to exercise regularly because of the heavy flying schedule....He has been working on balancing time with his family, self and job. He admittedly feels out of balance....he knows he needs to lose some weight." The physician's diagnosis of the patient's condition was "gastritis with mild reflux symptoms" , mild hypercholesterolemia, and fatigue. The record indicated that the physician took the following actions:

> Reviewed issues surrounding balance in general. Discussed and encouraged routine exercise. Discussed mechanisms for balance and making choices on a day to day basis. Have [prescribed] Cimetidine....Discussed appropriate use of caffeine. Info given today on fats in the diet and discussed the cholesterol levels would probably be normal when weight is lost....

According to the pilot's most recent FAA medical examination, on September 27, 1996, the pilot was 73 inches tall and weighed 235 pounds.

AIRCRAFT INFORMATION

The aircraft was maintained under an FAA-approved continuous airworthiness inspection program. Review of the aircraft maintenance records revealed that the aircraft had received all required inspections in the most recent inspection cycle within the prescribed time frame. The aircraft had been damaged while on the ground in a wind storm several years prior to the accident, and this damage had been repaired. No other significant history of discrepancies or damage was noted in the aircraft maintenance records. The operator reported the airframe total time as 12,300.87 hours.

Examination of the aircraft wreckage and the aircraft load manifest (which was recovered from the wreckage) indicated that at the time of the accident, the aircraft's cargo consisted of 305 pounds of bank documents and medical lab supplies. Based on the data recorded on the load manifest, investigators found the aircraft to have been loaded within weight and balance limits.

According to the PA-34-200T pilot's operating manual, the airplane has a positive flight load factor limit of 3.8 G maximum (flaps up), and a negative flight load factor limitation of "No inverted maneuvers approved." The airplane's design maneuvering speed is 140 MPH indicated airspeed (IAS), its maximum structural cruising speed is 190 MPH IAS, and its never-exceed speed is 224 MPH IAS. Under standard atmospheric conditions at 9,000 feet, these speeds correspond to true airspeeds of 160 MPH, 217 MPH, and 255 MPH, respectively. Performance data in the pilot's operating manual indicates that under standard atmospheric conditions at 9,000 feet, the airplane cruises at a true airspeed of approximately 189 MPH at 65% power and 202 MPH using 75% power. The transcript of the radio conversation between the two AIRPAC pilots on company frequency, furnished by the fellow AIRPAC pilot flying from Spokane to Seattle that night, indicated that the accident aircraft was cruising at approximately 147 knots (169 MPH) ground speed.

WRECKAGE

The airplane wreckage was examined at the accident site on October 9, 1996. Follow-up examinations of the wreckage were conducted at the wreckage storage facility in Issaquah, Washington, on October 11, 1996, and on November 14, 1996. The on-site examination of the wreckage revealed that the wreckage was spread over approximately a 700-yard area. The accident site was in the foothills on the aircraft's approach toward the Cascade mountain range, which the flight was to have crossed en route to Seattle, and was lightly to moderately wooded.

The main wreckage, which was lying inverted, consisted of the fuselage with left wing, propeller, and engine, and vertical tail folded over 90 degrees to the right of the fuselage. It was missing the entire horizontal stabilator; however, the stabilator mass balance weight had detached from the stabilator at the point where the mass balance weight bolts to the stabilator spar, and the mass balance weight had remained with the main wreckage, attached to the remainder of the main wreckage by stabilator control cables. The right wing had also detached at the root; the right wing root area exhibited signatures of downward overstress

fracture. The cabin ceiling was collapsed downward (with respect to the top of the aircraft) to the point of contact with the aircraft seats and cargo, and both seat backs had been collapsed from their normal upright position to a "fully reclining" type position, with the seat backs lying flat on the aircraft floor. The collapsed cabin ceiling constituted the principal crush damage to the main wreckage. The left flap and left main gear were in the up position. The nose of the aircraft forward of the cabin forward bulkhead was also separated from the main wreckage, with the exception of the nose gear structure which remained attached to the cabin forward bulkhead. The nose gear was in the up position but the entire nose gear structure was bent downward (with respect to the top of the aircraft) at approximately a 35-degree angle with respect to the fuselage reference line.

The main wreckage was lying with the nose pointed down a 14-degree slope on a heading of 284 degrees magnetic. No damage to trees in the immediate area of the main wreckage was noted. Ground scarring in the vicinity of the main wreckage was minimal and proceeded downhill toward the main wreckage location. The pilot's body was found inside the aircraft cabin. A medicine bottle resembling a container of Mylanta antacid in size, shape and coloring, but bearing a generic antacid label, was found in the pilot's personal effects in the aircraft wreckage. However, there was no physiological evidence in the aircraft wreckage to indicate that the pilot had actually become ill while in flight. Based on a plot of Global Positioning System (GPS) coordinates of the main wreckage site onto a Seattle sectional chart, the main wreckage site was approximately 1 nautical mile right of the V2 airway centerline, with respect to a westbound direction of flight along the airway.

The right wing had separated into two sections: an outboard section, consisting of the wing from just outboard of the nacelle to the wingtip, located about 500 yards southeast of the main wreckage; and right inboard section with nacelle (minus engine and propeller), located about 200 yards northeast of the right outboard wing section. The right inboard wing/nacelle section was missing the flap, except for an approximate 2-foot section of the inboard portion of the flap which remained in place. The inboard wing/nacelle section was found lying inverted, and the right main gear was in the up position. The right outboard wing section was missing its aileron. The right engine and propeller were not found.

The horizontal stabilator, in two sections, was found about 250 yards north of the right inboard wing/nacelle section during wreckage recovery. The stabilator had separated from the fuselage structure at an aft fuselage bulkhead; both stabilator hinges were in place on the stabilator and functional. The stabilator itself had also separated into two sections, with the sectioning fracture face along an approximately chordwise line about 1 foot outboard of the left stabilator root. Three of the four stabilator hinge mounting brackets, which join the stabilator hinges and aft fuselage bulkhead to the remainder of the fuselage structure, remained attached to the aft fuselage bulkhead/stabilator hinge assembly. The presence of the upper left stabilator hinge mounting bracket was not observed in the wreckage by investigators, but a portion of a sheared rivet was found in one hole where the missing bracket fastens to the stabilator hinge. Visual examination of the three stabilator hinge mounting brackets which were present revealed fracture signatures indicative of overstress. A deep

deformation was noted on the lower stabilator stop, and the lower stabilator stop bolt was bent.

Visual inspection of the left engine exterior revealed it to be substantially intact externally. One left propeller blade was largely straight, but exhibited slight forward bending at the tip as well as chordwise scratching. The other left propeller blade was bent back 90 degrees at about mid-span, with the tip curled back forward 180 degrees relative to the rest of the blade.

The Kittitas County Sheriff reported to the NTSB on October 14, 1996, that a private citizen had reported to the sheriff the previous day that on October 12, 1996, she had discovered "[two] items that appear to be parts from a plane" on her property. The items were described in a written sheriff's report as a "white painted piece of aluminum, approx[imately] 4 feet long 18 inch[es] wide with rounded edges", which was "possibly [a] part of [the] wing"; and a 1/8 inch thick, 2 1/2-by 2 1/2 foot piece of fiber material which was painted green on one side and "natural color" on the other. A map comparison of the reported address of this find with the main wreckage location revealed the newly discovered items to be approximately 2/3 mile east-southeast of the main wreckage site.

There was no evidence of fire in any section of the aircraft wreckage. Also, no evidence of flight control malfunction was found.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy was conducted under the authority of the coroner of Kittitas County, Washington, at the Cascades Funeral Home, Cle Elum, Washington, on October 10, 1996. The cause of death was attributed to "multiple skeletal fractures and visceral lacerations due to blunt impact to the head and trunk." Examination of the gastrointestinal tract during the autopsy reported no redness or ulceration observed within the esophagus or stomach lining, and "no correlation with reported recent symptoms of gastrointestinal distress." The stomach contents were reported as "30 ml of...apparent fruit" (NOTE: the fellow AIRPAC pilot, in his statement to investigators, reported that the accident pilot may have consumed an apple at Spokane.) The autopsy also reported that an approximately 2/3 occlusion of a cross-section of the left anterior descending coronary artery was found.

Toxicology tests on the pilot were conducted by the FAA Civil Aeromedical Institute (CAMI), Oklahoma City, Oklahoma. The CAMI toxicology tests screened for carboxyhemoglobin, cyanide, ethanol, and drugs and did not detect any of these substances.

SURVIVAL ASPECTS

Following the loss of contact with AIRPAC 72, the Seattle ARTCC sector 2 radar controller attempted to utilize other aircraft in the area as radio relays to contact the flight, without success. He then asked several aircraft in the area to listen for an emergency locator transmitter (ELT) signal on 121.5 MHz. Of these aircraft, only one (America West flight 959,

which according to ATC records was approximately 40 miles south of the accident location at the time) reported a weak signal, at 0345:18, which lasted "just a few seconds." The Seattle ARTCC controller also asked some of the aircraft in the area to attempt to visually spot the accident aircraft, again without success. He then reported the loss of contact to his area manager in charge (at 0345, according to Seattle ARTCC facility operation logs) and an Alert Notice (ALNOT) was issued on the missing aircraft. The Seattle terminal radar control (TRACON) facility and AIRPAC Operations were also contacted and queried as to whether either of those agencies had contact with the accident flight; both responded negatively. A ramp check of airports in the vicinity of the loss of contact was also requested. According to ATC records, the ALNOT on AIRPAC 72 was canceled at 1507 due to the aircraft wreckage being located.

TESTS AND RESEARCH

Four sections of the aircraft's upper and lower horizontal stabilator spar caps, from the fracture face on which the stabilator had separated into two sections, were sent to the NTSB Materials Laboratory, Washington, D.C., for metallurgical examination of the fracture surfaces. The Materials Laboratory reported that all fracture surfaces examined exhibited signatures indicative of overstress fracture.

The aircraft's horizontal stabilator mass balance weight was taken to Sky Services, Inc. of Auburn, Washington, on June 16, 1997, for a weight check. The check found the mass balance weight to be within service manual weight tolerances for an aircraft equipped with de-icing boots (as was the case with the accident aircraft.)

ADDITIONAL INFORMATION

AIRPAC's FAA principal operations inspector (POI) reported to the NTSB that following the accident, he conducted a series of confidential interviews with AIRPAC pilots in an effort to explore AIRPAC's corporate safety culture. He stated that he interviewed all but two of AIRPAC's pilots during these interviews. The FAA POI reported that all pilots interviewed, without exception, expressed a strong belief that AIRPAC adequately emphasized safety in its operations, with some pilots explaining that safety was stressed during new-hire training.

The aircraft wreckage was released to Mr. Tracy Barrus of Barrus & Stiger, Bellevue, Washington, on September 12, 1997. Mr. Barrus is the field adjuster for American Eagle Insurance, Inc., the insurance company underwriting AIRPAC Airlines.

Pilot Information

Certificate:	Commercial; Flight instructor	**Age:**	33,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:**	No
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine; Instrument airplane	**Toxicology Performed:**	Yes
Medical Certification:	Class 1 Valid Medical--w/ waivers/lim	**Last FAA Medical Exam:**	September 27, 1996
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	1539 hours (Total, all aircraft), 148 hours (Total, this make and model), 133 hours (Last 90 days, all aircraft), 70 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N666HL
Model/Series:	PA-34-200T PA-34-200T	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	34-7770235
Landing Gear Type:	Retractable - Tricycle	**Seats:**	2
Date/Type of Last Inspection:	September 18, 1996 Continuous airworthiness	**Certified Max Gross Wt.:**	4570 lbs
Time Since Last Inspection:	61 Hrs	**Engines:**	2 Reciprocating
Airframe Total Time:	12301 Hrs	**Engine Manufacturer:**	Continental
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	TSIO-360-EB
Registered Owner:	AIRPAC AIRLINES INC.	**Rated Power:**	200 Horsepower
Operator:		**Operating Certificate(s) Held:**	Air cargo
Operator Does Business As:		**Operator Designator Code:**	APCA

Meteorological Information and Flight Plan

Conditions at Accident Site:	Unknown	**Condition of Light:**	Night/dark
Observation Facility, Elevation:	YKM ,1095 ft msl	**Distance from Accident Site:**	38 Nautical Miles
Observation Time:	02:56 Local	**Direction from Accident Site:**	140°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	5 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	250°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30 inches Hg	**Temperature/Dew Point:**	11°C / 8°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	SPOKANE , WA (GEG)	**Type of Flight Plan Filed:**	IFR
Destination:	SEATTLE , WA (BFI)	**Type of Clearance:**	IFR
Departure Time:	02:15 Local	**Type of Airspace:**	Class E

Airport Information

Airport:		**Runway Surface Type:**	
Airport Elevation:		**Runway Surface Condition:**	
Runway Used:	0	**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal	**Latitude, Longitude:**	47.199768,-120.900444(est)

Administrative Information

Investigator In Charge (IIC):	Nesemeier, Gregg
Additional Participating Persons:	JEROME L SPAULDING; SPOKANE , WA MICHAEL MCCLURE; ARLINGTON , TX MICHAEL J GRIMES; LANCASTER , CA
Original Publish Date:	March 31, 1998
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=42484