National Transportation Safety Board
Aviation Accident Final Report

Location:	San Jose, CA	**Accident Number:**	LAX02FA101
Date & Time:	03/06/2002, 1035 PST	**Registration:**	N444JV
Aircraft:	Cessna 425	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	3 Fatal
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

The aircraft was on an IFR clearance and climbing through a cloud layer when it broke up in flight following an in-flight upset. The weather conditions included multiple cloud layers from 4,000 to 13,000 feet, with a freezing level around 7,000 feet msl. An AIRMET was in effect for occasional moderate rime to mixed icing-in-clouds and in-precipitation below 18,000 feet. As the airplane began to intercept a victor airway, climbing at about 2,000 feet per minute (fpm), and passing through 6,700 feet, the airplane began a series of heading and altitude changes that were not consistent with its ATC clearances. The airplane turned right and climbed to 8,600 feet, then turned left and descended to 8,000 feet. The airplane then turned right and climbed to 8,500 feet, where it began a rapidly descending right turn. At 1034:33, as the aircraft was descending through 7,000 feet, the pilot advised ATC "four Juliet victor I just lost my needle give me..." No further transmissions were received from the accident airplane and the last radar return showed it descending through 3,200 feet at about 11,000 fpm. Analysis of radar data shows the airplane was close to Vmo at the last Mode C return. Ground witnesses saw the airplane come out of the clouds in a high speed spiral descent just before it broke up about 1,000 feet agl. Examination of the wreckage showed that all structural failures were the result of overload. The aircraft was equipped with full flight instruments on both the left and right sides of the cockpit; however, the flight director system attitude director indicator and horizontal situation indicator were only on the left side. The aircraft was also equipped for flight into known icing conditions, with in part, heated pitot tubes (left and right sides), static sources, and stall warning vanes. During the on-scene cockpit examination, except for the pitot heat switches, the cockpit controls and switches were found to be configured in positions consistent with the aircraft's phase of flight prior to the in-flight upset. The right pitot heat switch was found in the ON position, while the left switch was in the OFF position. The left pitot heat switch toggle lever was noticeably displaced to the left by impact with an object in the cockpit. With the exception of the left pitot heat, the anit-ice and deice system switches were all configured for flight in icing conditions. The pitot heat switches, noted to be of the circuit breaker type (functions as both a toggle switch and circuit breaker), were removed from the panel and sent to a laboratory for examination and testing. Low power stereoscopic examination of the switches found that the right switch was intact, while the toggle lever mechanism of the left switch was broken loose from the housing. Microscopic examination of the left switches housing fracture surface revealed imbedded debris and wear marks indicative of an old fracture predating the accident. The broken left switch could be electrically switched by physically holding the toggle lever mechanism in the appropriate ON or OFF position. The electrical contact resistance measurements of the left switch varied between 0.3 and 1.4 ohms, and was noted to be intermittently open with the switch in the ON position. Both switches were then disassembled. While particulate debris was found in both switches, the left one had a significant amount of large coarse fibrous lint-like debris. The flexible copper conductor of the left switches circuit breaker section had several broken strands, and the electrical contacts were dirty. The laboratory report concluded that the left switches toggle was bent to the left in the impact sequence; however, the housing fracture predated the accident and allowed an internal build-up of large coarse fibrous lint-like debris. The combined effects of the broken housing, the resulting misalignment of the toggle mechanism, the dirty contacts, and the large coarse lint debris prevented reliable electrical switching of the device and presented the opportunity for intermittently open electrical contacts. Continuity of the plumbing from the pitot tubes and static ports to their respective instruments was verified. Electrical continuity was established from the bus power sources through the circuit breakers and switches to the heating elements of the pitot tubes and static sources. The heating elements were connected to a 12-volt battery and the operation of the heating elements verified.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: the pilot's loss of control and resulting exceedence of the design stress limits of the aircraft, which led to an in-flight structural failure. The pilot's loss of control was due in part to the loss of primary airspeed reference resulting from pitot tube icing, which was caused by the internal failure of the pitot heat switch. Factors in the accident were the pilot's distraction caused by the airspeed reading anomaly and spatial disorientation.

Findings

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

Findings
1. WEATHER CONDITION - CLOUDS
2. (C) WEATHER CONDITION - ICING CONDITIONS
3. ANTI-ICE/DEICE SYSTEM - SELECTED - PILOT IN COMMAND
4. (C) ANTI-ICE/DEICE SYSTEM,PITOT HEAT - NOT OPERATING
5. AIRSPEED INDICATOR - INCORRECT
6. (C) AIRCRAFT CONTROL - NOT MAINTAINED - PILOT IN COMMAND
7. (F) DIVERTED ATTENTION - PILOT IN COMMAND
8. (F) SPATIAL DISORIENTATION - PILOT IN COMMAND

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

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

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

Findings
12. TERRAIN CONDITION - GROUND

Factual Information

1.1 HISTORY OF FLIGHT

On March 6, 2002, at 1035 Pacific standard time, a Cessna 425, N444JV, experienced a loss of control and a subsequent in-flight breakup at San Jose, California. The aircraft descended to ground impact in an area of rolling, hilly pasture land. The aircraft was owned and operated by the pilot under the provisions of 14 CFR Part 91 of the Federal Aviation Regulations. The aircraft was destroyed in the accident sequence. The instrument rated private pilot and two passengers sustained fatal injuries. Instrument meteorological conditions prevailed at the altitude where the loss of control occurred. The flight departed the Reid-Hillview airport in San Jose at 1029, and was en route nonstop to La Paz, Mexico. An instrument flight rules flight plan was filed, and the pilot had received an instrument clearance prior to departure.

According to a review of recorded air-to-ground communications tapes and radar data obtained from the Federal Aviation Administration (FAA) Bay Terminal Radar Approach Control facility, the aircraft was initially cleared after takeoff to climb to 13,000 feet msl on radar vectors to Victor airway 485. The controller issued a heading of 110 degrees, then told the pilot to intercept the airway and proceed on course. The communications tapes, along with recorded radar data, disclosed that the airplane was climbing at about 2,000 feet per minute (fpm) through 6,700 feet when it began a series of heading and altitude changes that were not consistent with its ATC clearances. The airplane turned right and climbed to 8,600 feet, then turned left and descended to 8,000 feet. The airplane then turned right and climbed to 8,500 feet, where it began a rapidly descending right turn. At 1034:33, as the aircraft was descending through 7,000 feet, the pilot advised ATC "four Juliet victor I just lost my needle give me..." No further transmissions were received from the accident airplane and the last radar return showed it descending through 3,200 feet about 11,000 fpm.

A ground witness to the accident was riding a horse about 1.5 miles from the impact site and was attracted to the airplane by a loud "screaming" jet sound. She looked up and saw the aircraft descend out of the clouds "in a cork-screw pattern." As the airplane got close to the ground, the flight path changed from a descent to a climb while still in the corkscrew turn, with the ascending corkscrew turns much tighter than the descending ones. The airplane then seemed to level off momentarily before it began an arcing and spiraling turn until it disappeared behind a hill. Additional witnesses on a golf course about 0.5-miles from the impact location heard a loud sound they characterized as like an explosion or gunshot. The airplane then rolled level, and continued in an arcing horizontal spin until it disappeared behind a hill. These two witnesses reported that they saw parts falling from the airplane and that it was "smoking."

Other ground witnesses located on a nearby golf course reported that they saw parts falling from the aircraft as it descended to the ground.

1.2 PILOT INFORMATION

The pilot's FAA Airman and Medical Records files were reviewed and they disclosed that he held a US private pilot certificate with land airplane ratings for single, multiengine, and instruments. The certificate was most recently issued as a replacement for a lost certificate on April 24, 2001. The US certificate was issued on the basis of Canadian pilot certificate number WGP 9287, and the records noted that the US certificate was valid only when accompanied by the Canadian certificate.

Detailed review of the airman record files disclosed that he first applied for a US private pilot certificate on the basis of his Canadian certificate on November 3, 1967. A US multiengine land practical test was passed on April 3, 1979, and that class rating was added to his certificate. The pilot applied for and passed the US written and practical tests for an airplane single engine instrument rating on October 11, 1988. On April 18, 1989, the pilot passed the US practical instrument rating test for multiengine airplanes; this test was taken in a Beech 90. The application for this practical test listed a total flight time of 1,956 hours, with 247 in the Beech 90.

The pilot held a third-class medical certificate, which was issued on August 2, 2000, with limitations that he wear corrective lenses and possess glasses for near and intermediate vision. At the time of the medical examination, the pilot reported a total flight time of 4,556 hours.

The pilot's most recent personal flight record book covering the period from November 2000 to the date of the accident was recovered in the wreckage and showed a total pilot time of 4,987 hours, with 2,471 hours in multiengine airplanes. The log recorded 636 hours of actual instrument flight time, with 138 hours of simulated instrument experience. The pilot purchased the airplane on October 10, 2000, and he logged about 400 hours in it prior to the accident.

The logbook showed a pattern of flight activity that was consistent at about 35 hours per month. On January 5, 2002, a biennial flight review was endorsed in the logbook, with the entry noting a total flight of 2.7 hours, with 1.9 hours in actual instrument conditions. An entry dated January 6, 2002, endorsed the completion of an instrument competency check. That entry listed a flight time of 3.4 hours, with 2.1 flown in simulated instrument conditions. The numbers of approaches flown are not delineated in the entry.

In the 90 and 30 days prior to the accident, the logbook records a total hours flown of 86 and 29, respectively.

A search of the FAA airman records database disclosed no record that the passenger who occupied the right front seat had ever held any grade of pilot certificate.

1.3 AIRCRAFT INFORMATION

The maintenance records were obtained from the facility, which performed the maintenance on the aircraft, Turbine Air, Inc., Hayward, California. In addition, information was obtained from Cessna Aircraft and Pratt & Whitney of Canada manufacturing records, and the official FAA Aircraft and Registry files.

According to the records examined, the aircraft, serial number 425-0013, was manufactured in December 1980, and was purchased by the pilot in October 2000. At the time of the accident, the airframe had accumulated a total time in service of 4,315 hours. The aircraft was equipped with full flight instruments on both the left and right sides of the cockpit; however, the flight director system attitude director indicator and horizontal situation indicator were only on the left side. The aircraft was also equipped for flight into known icing conditions, with in part, heated pitot tubes (left and right sides), static sources, and stall warning vanes.

The aircraft was maintained on the Cessna Continuous Airworthiness Inspection Program for the model 425. The program consists five inspection phases, with varying flight hour intervals between phases depending on the phase number. A chart detailing the inspection requirements is appended to this report. According to the records, the most recent Phase 2 inspection (100-hour/annual equivalent) was completed on March 5, 2002, 2 hours prior to the accident. The most recent pitot-static system test and certification in accordance with 14 CFR 91.411 was accomplished on September 28, 2001.

In September 2000, the original Pratt & Whitney of Canada PT6A-112 engines and Hartzell 3-bladed propellers were removed from the airplane. Factory new PT6A-135A engines, serial numbers PZ0040 and PZ0041, were installed in the respective left and right positions. In addition, factory new 4-bladed McCauley 4HFR34C762-1 propellers were installed, serial numbers 992818 on the left side and 000463 on the right position. This work was accomplished in accordance with Supplemental Type Certificate 5786SW. The engines and propellers had accumulated a total time in service of 337 hours at the time of the accident.

Comparison of maintenance records with the FAA listing of Airworthiness Directives applicable to the airframe, engines, and propellers by serial number disclosed that all AD's were complied with.

During the review of the maintenance records, two major repairs were found for structural elements in the airframe. The first concerned the replacement of the left horizontal stabilizer leading edge skin due to bird strike damage sustained in October 1998. This repair was accomplished in accordance with Cessna Engineering Order 425-0663. The second repair was the installation of reinforcement kits (Cessna kit numbers SK-425-44-1 and SK425-44-2) to the right wing forward lower spar cap. These kits were installed in response to a crack that was detected in the spar cap during an inspection for compliance with AD 91-25-08. Details of these repairs are included in the maintenance records appended to this report.

In an interview, the pilot's son noted that he had spoken with his father 3 or 4 days prior to the accident flight. The pilot was satisfied with the airplane in general, and had not mentioned any chronic or unresolved problems.

At the request of the National Transportation Safety Board investigators, an airworthiness inspector from the San Jose Flight Standards District Office went to the Reid-Hillview airport on the afternoon of March 6 to determine the recent fueling on the accident aircraft. He determined that Nice Air had fueled the airplane on the day before the accident (03-05-02) at the pilot's request. He obtained a sample of fuel from the truck used to refuel the airplane and also interviewed the refueling technician.

According to records at Nice Air, the pilot had requested that the airplane be refueled to capacity (a total of 186 gallons in each of the left and right tanks). The fueling technician stated that he had put 107 gallons of Jet A into the left tank when the truck ran out of fuel during the processing of filling the airplane. Nice Air only has jet fuel in a tank/pumper truck and there is no underground storage or other source of Jet A on the airport. No other Fixed Base Operator on the airport carries Jet A, and fuel for the truck has to be brought in by a delivery truck. The fueling technician said the pilot arrived later that afternoon and was very upset that 107 gallons had been placed into the left tank, with none added to the right, and had ordered the technician to take 50 gallons from the left tank and place it in the right. The pilot then got in his car and left the airport.

The technician reported that he took a hand pump and a 5-gallon plastic container, put the suction end of the pump hose into the left tank and transferred 50 gallons to the right tank, 5 gallons at a time. The technician could not provide an estimate as to how much fuel was in the left tank at the beginning of the fueling process, or, when the truck ran out of fuel. At the time of the interview by the FAA inspector, the technician could not identify the specific plastic container used for the fuel transfer.

The FAA inspector examined the truck used to refuel the airplane. During this process he got on top of the tank and opened the cover. The interior of the tank was clean without debris of any kind. Only a small residual quantity of what appeared to be clean fuel remained in the tank. After closing the cover, he actuated the power takeoff and took the sample from the dispensing nozzle. Approximately 1 pint of fuel was dispensed into a clean sample container he brought with him before the flow stopped.

Safety Board investigators attempted to reconstruct the aircraft takeoff gross weight and center of gravity. Beyond the uncertain fuel quantity discussed above, the investigators found that fire department personnel who initially responded to the accident site had removed most of the baggage from the rear baggage areas and from the forward nose bays without documenting what bags came from what location. Investigators interviewed the fire personnel and identified the baggage that was believed to have come from each location. Based on this reconstruction, the aircraft could not have had more than 266 gallons of fuel, with 133 gallons distributed in each of the left and right tanks. The total baggage area contents were estimated at about 150 pounds, with 20 pounds in the avionics bay, 30 pounds in the nose baggage compartment, and 50 pounds each in rear baggage area bays A and B. The occupant weights were determined from either official state and/or federal identification records, or from the medical examiners determination of post mortem weight. Using this reconstruction, the takeoff gross weight was estimated to be 7,804 pounds (maximum allowable takeoff gross weight is 8,600 pounds), with a center of gravity at 158.8 inches (the envelop range at 7,800 pounds is from 154.5 to 160 inches). A sheet detailing the computations is appended to this report.

1.4 METEOROLOGICAL INFORMATION

1.4.1 Witness Reports

A pilot witness who was airborne at the time of the accident in the vicinity of the crash site was interviewed. He holds a commercial pilot certificate, with airplane ratings for single engine, multiengine, and instruments. As part of his employment, he flies traffic reporter(s) for two San Francisco Bay area stations. On the morning of the accident, he was airborne in the vicinity of San Jose with a traffic reporter on board.

He remembered hearing the transmission from the pilot of N444JV to the effect that he had "lost his needle." Shortly after that, the Bay TRACON controller vectored him to the vicinity of the last observed radar target for N444JV and asked him to look for the airplane on the ground. The reporter in his aircraft was the first one to spot the wreckage. Neither he nor the reporter actually saw the airplane crash.

The witness was asked to summarize the weather conditions he observed at the time. He said he was at 1,500 feet, roughly 1,000 feet above ground level. He reported that the lowest cloud layer was scattered at 1,600 msl, with a higher overcast layer he estimated at 2,000 feet. The visibility beneath the clouds was good, and in the range of 10 miles. No rain was falling. The atmospheric turbulence conditions consisted of light chop. He experienced no ice accumulation and noted that the temperature was well above freezing, though he could not remember an exact number. He was asked about any rain shafts, funnel clouds, or other unusual meteorological phenomenon in the area. He stated that he observed none.

Review of the recorded air-to-ground communications tapes disclosed that two air carrier flights departing the Oakland International Airport during the time frame of the accident flight reported the tops of the clouds to be 9,500 feet. One flight requested a deviation left of course from Bay TRACON to avoid a cell build-up. Based on the Standard Instrument Departure routings out of Oakland, the area of concern for that flight would have been 15 to 20 miles northeast of the accident site.

1.4.2 Safety Board Meteorological Study

A Safety Board staff meteorologist conducted a study of the weather conditions in the vicinity of the accident site. The full report is contained in the docket for this accident.

The closest weather observation to the accident site was from San Jose International Airport (KSJC), located approximately 14 miles northwest of the accident site at an elevation of 58 feet. The airport has an Automated Surface Observation System (ASOS) and was augmented by NWS Certified weather observers. The following conditions were reported surrounding the time of the accident:

KSJC weather at 0953, wind from 100 degrees at 7 knots; visibility 10 statute miles; a few clouds at 900 feet, scattered clouds at 2,500 feet, second scattered clouds layer at 9,000 feet; temperature 14 degrees Celsius; dew point 13 degrees Celsius; altimeter 29.98 inches of Mercury (Hg). Remarks: automated observation system, rain began at 1705Z and ended at 1750Z, sea level pressure 1015.2 mb, precipitation last hour 0.03 inches, 6-hour rainfall 0.04 inches, 3-hour pressure tendency steady at 0.00 mb.

KSJC weather at 1053, wind from 210 degrees at 8 knots; wind variable from 140 degrees to 260 degrees; visibility 10 miles; a few clouds at 900 feet, scattered clouds at 1,300 feet, ceiling broken at 4,000 feet; temperature 16 degrees Celsius; dew point 9 degrees Celsius; altimeter 29.98 inches of Hg.

The NWS 850 mb Constant Pressure Chart for 1200Z on March 6, 2002, depicted conditions at approximately 5,000 feet. The chart depicted a low pressure system over Washington State with a trough of low pressure off the California coast. A second low pressure trough was depicted by the contour lines over Nevada and southeastern California. A high pressure system was located over the surface position with a ridge extending northeast over southern California. The closest upper air sounding to the accident site was from Oakland, which depicted a wind from the west-southwest at 25 knots, a temperature of +6 degrees Celsius (C), and a dew point depression of 1 degree C. The +5 degree isotherm crossed in the immediate vicinity of the Oakland upper air sounding.

The NWS 700 mb Constant Pressure Chart for 1200Z depicted conditions at approximately 10,000 feet. The chart depicted a low pressure system off the Oregon coast with a trough of low pressure extending southwest with several short wave troughs approaching the northern California coast. The Oakland station model depicted a wind from the southwest at 35 knots, a temperature of -2 degrees C, and a dew point depression of 1 degree C.

The NWS Radar Summary Chart for 1015 on March 6, 2002, depicted an area of echoes over central and northern California and Nevada classified as rain and rain showers. The echoes range from light-to-moderate intensity (Level 1-to-2) covering most of central and northern California to strong-to-very strong intensity (Level 3-to-4) activity in the immediate vicinity and to the southeast of the accident site.

The closest upper air sounding was from Oakland, California (KOAK), site 72493, located approximately 39 miles northwest of the accident site at an elevation of 10 feet. The 1200Z sounding on March 6, 2002, indicated a saturated environment with the temperature and dew point spread less than 2 degrees C and a relative humidity greater than 85 percent from the surface to 10,800 feet. The freezing level (location of the 0 degrees C) was identified at 734 mb or 8,790 feet, with temperatures below freezing above even with an inversion identified between 672 mb and 667 mb, or between 11,089 feet and 11,280 feet. The wind flow was identified from the southeast at 5 knots at the surface and veering with height to the southwest below 18,000 feet, and then to the west above. The observation at 7,000 feet, the last known altitude of the accident airplane was the wind from 225 degrees at 28 knots, and a temperature of 2.6 degrees C.

The NWS issues in-flight weather advisories designated as Severe Weather Forecast Alerts (AWW's), Convective SIGMET's (WST's), SIGMET's (WS's), Center Weather Advisories (CWA's), and AIRMET's (WA's). At the time of the accident, the NWS Aviation Weather Center (AWC) located in Kansas City, Missouri, had a series of AIRMETs current over the accident site for IFR and mountain obscuration, icing, and turbulence conditions. The AIRMETs were issued at 1445Z and were current until 2100Z.

AIRMET Sierra, update number 4, concerned IFR conditions over specified portions of Washington, Oregon, and California. The advisory warned of occasional overcast ceilings below 1,000 feet and/or visibilities below 3 miles in clouds, precipitation, and mist. Conditions were forecast to end between 1800Z and 2100Z. The accident site was located within this advisory.

AIRMET Sierra was issued for mountain obscuration over portions of Washington, Oregon, California, Idaho, Montana, Wyoming, Nevada, Utah, and Colorado. The advisory warned of mountains occasionally obscured in clouds, precipitation, and mist. Conditions were expected to continue beyond 2100Z through 0300Z. The accident site was also enclosed by this AIRMET.

AIRMET Tango, update 2, was issued for turbulence over portions of Washington, Oregon, California, Idaho, Montana, Wyoming, Nevada, Utah, and Colorado. The advisory warned of occasional moderate turbulence below 18,000 feet due to strong west to southwesterly mid- to low-level wind flow across rough terrain. The conditions were expected to continue beyond 2100Z through 0300Z. The accident site was also located within the boundaries of this advisory. The AIRMET was repeated again at 1604Z when an area of moderate turbulence was identified between 18,000 and 35,000 feet.

AIRMET Zulu, update 2, was issued for icing conditions over portions of Washington, Oregon, California, Idaho, Montana, Wyoming, Nevada, and Utah. The advisory warned of occasional moderate rime to mixed icing-in-clouds and in-precipitation below 18,000 feet. Conditions were expected to continue beyond 2100Z through 0300Z.

No Severe Weather Forecast Alerts, Convective SIGMETs, or SIGMETs were issued for California during the period, and no Center Weather Advisories were issued by the Oakland Center during the period from 1660Z through 2000Z on March 6, 2002.

1.5 COMMUNICATIONS

A certified re-recording of the air-to-ground communications between the aircraft and Bay TRACON was obtained and reviewed. From the time the aircraft first contacted Bay TRACON at 1029:38 until 1034:22 all communications were routine, with no difficulties noted. The last transmission from the aircraft occurred at 1034:33, with the pilot stating, "four Juliet victor I've just lost my needle give me..." No further transmissions were received from the aircraft. A transcript of the communications is contained in the docket for this accident.

1.6 WRECKAGE AND IMPACT

The accident site is in low rolling costal hills about 10 nautical miles southwest of the Reid-Hillview airport. In character, the hills are steeply slopped, averaging between 30 and 45 degrees, and populated by scattered oak trees and mansanita scrub brush typical of the mid to northern California coastal region. The elevation of the fuselage resting point was measured by GPS at 493 feet msl.

The wreckage was found distributed over 0.3-nautical mile distance on a median magnetic bearing of 102 degrees. The most distant debris from the main fuselage wreckage consisted of the right wing tip. The debris field between this point and the fuselage consisted of right wing outer panel components, the right aileron, the complete horizontal stabilizer assembly, the upper half of the rudder, and the left elevator. All control surfaces and their associated mass balance weights were accounted for in the debris field.

Main landing gear visually appeared in the down and locked position, while the nose gear appeared to be in an in-transit position.

The vertical stabilizer, fuselage, engines, engine nacelles, inboard right wing, inboard and outboard left wing came to rest on the side of a hill that separated it from the rest of the wreckage components in the debris field. The remaining wreckage components were found in the debris field and principally consisted of the rudder balance weight, both elevator balance weights, left wing tip fairing, horizontal stabilizer with right elevator attached, upper section of the rudder, left elevator suspended in a tree, outboard section of the right wing, and the right wing tip fairing.

The fuselage came to rest inverted at 493 feet mean sea level (ms;) on the southern side of a 550-foot msl steep hill, and the nose of the airplane was upslope on a measured magnetic bearing of 290 degrees. An impact scar, consistent with the inverted fuselage and engine nacelles, was located approximately 50 feet upslope and right of the fuselage resting point. The impact scar was orientated on a measured magnetic bearing of 300 degrees. The top of the fuselage was crushed level with the bottom of the windows. The cockpit and cabin area was crushed. The nose landing gear was partially extended, and the nose wheel well base displayed an impact mark consistent with the nose wheel tire.

The left wing and engine remained attached to the fuselage. The top of the engine cowling was found crushed around the engine. The propeller hub, with three propeller blades, was attached to the engine, and one blade was separated from the hub approximately 4 inches from the blade root. The three blades were found turned in the hub toward the feathered position. The left main landing gear strut and wheel assembly was found in the extended position. The left wheel well top panel (upper wing skin) displayed dents and paint scrapes geometrically consistent with the wheel and strut assembly components.

The inboard right wing with the engine was separated at about the center section to wing panel attach point; however, it remained attached to the fuselage via control cables, fuel lines, and electrical wires. The top of the engine cowling was crushed around the engine. The propeller hub with its four blades remained attached to the engine. The four blades were found turned in the hub toward the feathered position. The right main landing gear strut and wheel assembly was found in the extended position. The right wheel well top panel (upper wing skin) displayed dents and impact marks consistent with the wheel assembly components. The wheel assembly shock strut was separated from the wheel assembly, and remained attached to the wing structure.

The emergency landing gear extension pneumatic blow down air bottle is located in the nose section just forward of the forward pressure bulkhead (FS 100) and in the upper portion of the compartment. This area of the fuselage sustained extensive vertical crush deformation. The bottle was discharged and the piston valve was found in the discharged position. The support mounting brackets for the bottle were deformed and the piston actuation cable was in close proximity to a large fold in the sheet metal bracket. Investigators noted that as fire department personnel cut into the root area of the right wing during victim recovery, the hydraulic lines were severed and a fine mist of hydraulic fluid blew into the air.

The right and left elevator balance weights were found in the bottom of a ravine approximately 486 feet and 850 feet, respectively, from the fuselage, with the rudder balance weight found between the two.

The left wing tip, with the landing light, was located on the southern slope of a steep 650-foot msl high hill. The horizontal stabilizer, with the right elevator attached, was found to the west of the left wing tip, approximately 900 feet from the fuselage.

The left elevator came to rest in a tree, which was located 425 feet west of the horizontal stabilizer and 1,275 feet northwest of the fuselage.

A section of the right outboard wing was found on the northern side of the 650-foot hill, approximately 1,300 feet from the fuselage. The aileron was missing and subsequently identified in the debris field in two sections; the outboard half was located about 200 feet north and east of the outboard right wing section, while the inboard half was found between the horizontal stabilizer and the left elevator.

The right wing tip was located on the north side of another steep hill approximately 1,700 feet from the fuselage. The landing light was separated from the wing tip structure.

Both the left and right exhaust tubes of each engine exhibited ductile crushing.

1.7 TESTS AND RESEARCH

The wreckage was recovered and transported to the facilities of Plain Parts, Pleasant Grove, California. On March 9, 2002, the wreckage was reconstructed at Plain Parts under the supervision of the Safety Board. The airplane pieces were arranged on stands and the floor in positions similar to the installed geometry on the airplane.

1.7.1 Left Wing

The outboard left wing remained attached to the engine nacelle structure; however, it was crippled at WS 137. Examination of the forward upper and lower wing spar caps disclosed evidence of compressive and tensile overstress on the lower and upper spar caps respectively, and the web was crushed. The web crush folds and deformation were consistent with loading in a positive direction. The aft wing spar disclosed evidence of compressive and tensile overstress on the upper and lower spar caps, which was consistent with a failure of this portion of the wing in a positive direction. The aileron remained attached via control cables and the inboard attach fitting. The outboard aileron attach fitting was twisted and bent outward. The aileron top skin displayed compression wrinkles, and the bottom skin was torn at a point that corresponds to the aft wing spar fracture point. The left wing tip was separated, and the attach rivets were pulled and sheared, with the rivet holes elongated in a diagonal direction with the load path from leading edge outboard to trailing edge. The navigation light bulb filament was stretched, and the strobe light bulb was broken.

The inboard left wing remained attached to the center section attach points. The forward and aft wing spars were intact.

The left wing inboard flap push rods were separated at the rod eye threaded ends and the tubes were bent. A witness mark geometrically and dimensionally identical to a wing skin stiffener fold was noted on the outboard flap torque tube. With the tube in a position corresponding to flaps up, the witness mark was lined up with the stiffener fold.

The left main landing gear was found in the extended and locked position. The up-lock hook was intact; however, the up-lock support structure was bent and smearing was noted on the upper edge of the retaining slot with a tactilely perceptible lip impressed into the edge. The shock strut exhibited scratched paint. The wheel well ceiling (upper wing skin) exhibited strike marks and dents in a pattern consistent with the lower strut, wheel and brake assemblies.

1.7.2 Right Wing

The outboard right wing separated from the structure, with the separation on a diagonal line from WS 143 on the leading edge aft and inboard to WS 119. The outboard wing panel also separated into several pieces, which were previously noted as found in the debris field. Examination of the forward and aft spars disclosed evidence of compressive and tensile overstress on the upper and lower spar caps, respectively, which was consistent with a primary failure of this portion of the wing in a positive direction. The spar cap to web attach rivets were sheared. The aileron was separated into two sections, which were located in the debris field. The aileron skin displayed compression wrinkles on the top surface. The aileron separation point corresponded to the aft wing spar separation point. Rivets that attach the forward spar and leading edge assembly to the wing skin were pulled, and the bottom rivets were intact but the skin was torn. The right wing tip was separated, and the attach rivets were pulled and sheared, with the rivet holes elongated in a diagonal direction with the load path from leading edge outboard to trailing edge. The strobe and navigation light lens was separated and found broken in the debris field. The navigation light bulb filament was stretched, and the strobe light bulb was broken.

The inboard right wing separated at the center section attach points (the upper spar cap fractured inboard of the attach clevis and the lower spar cap fractured outboard of the clevis). Examination of the forward spar disclosed evidence of tensile and compressive overstress on the upper and lower spar caps, respectively. The aft spar disclosed evidence of compressive and tensile overstress on the upper and lower spar caps, respectively. The fractures of this section are consistent with the wing structure bending downward and twisting aft. Rivets, located on the aft spar rivet line, were pulled from the wing skin, while the rivets along the inboard rivet line were sheared. The flap and aileron cables were separated with a "broomstrawed" appearance consistent with tensile overstress. The flap cables pulled downward through the guide holes, which were located near the inboard flap push/pull rod, into the stringer webbing. The aileron cable pulled upward through the guide hole, which was located near aft wing spar attach fitting in the stringer webbing. The three inboard and outboard flap rods were bent, and the outboard flap torque tube was fractured at the connector. The outboard flap torque tube exhibited a kink and associated witness marks in the surrounding structure consistent with the flaps in the UP position.

The right main landing gear was found in the extended and locked position. The up-lock hook was intact; however, the up-lock support structure was bent and smearing was noted on the upper edge of the retaining slot with a tactilely perceptible lip impressed into the edge. The wheel well ceiling (upper wing skin) exhibited heavy strike marks and dents in a pattern consistent with the lower strut, wheel, and brake assemblies. The tire was intact and inflated. The brake line and fittings were intact. The shock strut was fractured at a point near the wheel assembly. The actuator, strut, and shock strut attach points were intact.

1.7.3 Horizontal Stabilizer

The horizontal stabilizer was separated from the empennage at its associated fore and aft fuselage attach points. The left horizontal stabilizer forward and aft spars were fractured, with the outboard span wise portion bent down approximately 20 degrees. The forward spar disclosed evidence of the tensile and compressive overstress on the upper and lower spar caps, respectively. The rear spar was fractured and disclosed evidence of tensile and compression over stress on the upper and lower spar caps, respectively. These fractures are consistent with the stabilizer structure bending downward in a positive direction. The aft lower spar cap rivet line was pulled from the bottom skin. A diagonal tear in the stabilizer upper skin, originating near the fuselage attach point and extending aft to the middle of the aft spar, and a compression wrinkle on the bottom skin were noted. The inboard 12 inches of the leading edge was crushed upward and aft.

The right horizontal stabilizer was intact. The leading edge displayed dents and the deice boot was scratched. The bottom skin exhibited a diagonal compression wrinkle which extended from forward inboard to aft outboard.

The left elevator was separated from the left horizontal stabilizer hinges. The outboard elevator hinge remained attached to the horizontal stabilizer fitting. A portion of the elevator skin remained attached to the outboard bottom elevator hinge, and the rivets were sheared on the outboard top hinge attach point. The center elevator hinge remained attached to the horizontal stabilizer. The elevator attach rivets were pulled and sheared from the elevator. The elevator pitch control horn remained attached to the elevator; however, the pitch link control rod connected to the control horn was fractured at the connector; the rod was not located. The outboard skin and counterweight were separated from the elevator. The elevator skin on the upper and lower surface of the elevator was deformed in a manner consistent with hinge over travel. The trailing edge fairing between the fuselage and elevator was separated and located in the debris field.

The right outboard elevator skin and counterweight were separated from the elevator. The outboard elevator hinge remained attached to the right horizontal stabilizer. The middle hinge rivets were pulled and sheared. The inboard hinge remained attached and the control push/pull rod was fractured at the empennage bell crank. The skin on the upper and lower surface of the elevator was deformed in a manner consistent with hinge over travel. The trailing edge fairing remained attached to the empennage structure and the fairing attach points were pulled form the attach screws on the stabilizer.

The fuselage-to-stabilizer attach bracket remained attached to the separated horizontal stabilizer. The bracket was fractured near the left attach bolt. The bottom bracket cap displayed evidence of the tensile overstress, and the upper bracket cap displayed evidence of compressive overstress. The attach bracket rivets were pulled from the fuselage structure. The elevator control tubes were separated at their respective connections near the fuselage bell crank.

The areas where prior repairs were performed to the structural elements in the left horizontal stabilizer leading edge and the right wing lower spar cap at a point 14.75 inches inboard of the inboard nacelle rib were examined. No failures or structural member deformation was observed in these areas.

1.7.4 Vertical Stabilizer

The vertical stabilizer was found crushed approximately flat and level with the fuselage. The covering skin was intact and remained attached to the internal rib assemblies. The forward and aft spars were intact, and the aft spar was separated from the lower attach point. The leading edge skin was crushed to the forward spar and displaced to the right. The deice boot was intact and tears were found in the boot. The stabilizer tip fairing was separated at the screw attach points; however, remained attached to the stabilizer via the VHF antenna wiring. The rudder cables were pulled through the guide holes and remained attached to the control bell crank. The rudder trim cables were attached to the control bell crank and were intact.

1.7.5 Control System

Control continuity for the aileron system was established from the FS180.7 bell crank forward to the cockpit controls, and, outboard to the cable separation points in the left and right wings. The cable separations were characterized by either a broom straw appearance with individual strand necking or were documented as having been mechanically cut by either fire fighters or wreckage retrieval personnel. Rudder cable continuity was established from the cockpit to the rudder bell crank control horns. Elevator continuity was established from the cockpit to the empennage elevator control bell crank. The elevator control rods were connected to the bell crank; however they were bent and separated from the left and right elevator control horns. The down spring was connected and intact.

The inboard and outboard flap panels on both wings were visually noted to be in an extended position. The cabin floor access panels were removed to expose the flap actuator. The left upper and right lower cable chains (extend cables) were found positioned on the respective actuator forward and aft sprockets with about three links exposed. According to the parts and maintenance manuals (page 27-50-00) for the aircraft, this corresponds to a flaps up condition. The right lower cable was separated at the wing root, with a broom straw appearance and necking of individual cable strands. The fore and aft flap push-pull control tubes were bent and distorted, with fractures noted to the tubes in the threaded portion that screws into the rod eye ends. (For the inboard flaps, the system is designed so that flap extension is accomplished by the rods being pulled in tension by the actuation bell crank; flap retraction applies a compressive load on the tubes and rod ends.)

1.7.6 Pitot Static System

Continuity of the plumbing from the pitot tubes and static ports to their respective instruments was verified. Electrical continuity was established from the bus power sources through the circuit breakers and switches to the heating elements of the pitot tubes and static sources. The heating elements were connected to a 12-volt battery and the operation of the heating elements verified.

During the on-scene wreckage operation and examination phase, Safety Board investigators documented the cockpit switch positions prior to any disturbance by search and rescue personnel for victim recovery. Except for the pitot heat switches, the cockpit controls and switches were found to be configured in positions consistent with the phase of flight of the aircraft prior to the in-flight upset. The right pitot heat switch was found in the ON position, while the left switch was in the OFF position. The left pitot heat switch toggle lever was noticeably displaced to the left with the pilot's left foot located close by.

The switches were labeled as to position and then removed from the panel following in aircraft system continuity checks and were noted to be of the circuit breaker type (functions as both a toggle switch and a circuit breaker). Both switches were submitted to a laboratory for examination and testing. A complete report of the examination appears in the docket material for this accident.

Low power stereoscopic examination of the switches found that the right switch was intact, while the toggle lever mechanism of the left switch was broken loose from the housing. According to the report, microscopic examination of the left switches housing fracture surface revealed imbedded debris and wear marks indicative of an old fracture. No other failure related external anomalies were noted.

The laboratory report noted that the electrical contact resistance measurements of the right switch varied between 0.6 and 1.2 ohms. The broken left switch could be electrically switched by physically holding the toggle lever mechanism in the appropriate ON or OFF position. The electrical contact resistance measurements of the left switch varied between 0.3 and 1.4 ohms, and was noted to be intermittently open with the switch in the ON position.

Following radiographic imaging for internal condition documentation of the switches in both the ON and OFF positions, the switches were disassembled and examined using low power stereoscopic optical microscopy. While particulate debris was found in both switches, the left one had a significant amount of large coarse fibrous lint-like debris. The flexible copper conductor of the left switches circuit breaker section had several broken strands, and the electrical contacts were dirty. No evidence of contact pitting from arcing was observed.

The laboratory report concluded that the left switches toggle was bent to the left in the impact sequence; however, the housing fracture predated the accident and allowed an internal build-up of large coarse fibrous lint-like debris. The combined effects of the broken housing, the resulting misalignment of the toggle mechanism, the dirty contacts, and the large coarse lint debris prevented reliable electrical switching of the device and presented the opportunity for intermittently open electrical contacts.

1.7.7 Electrical System

Prior to the arrival of Safety Board investigators, responding fire department personnel during victim recovery operations had cut into the left forward and right aft fuselage sidewalls, severing several electrical wire bundle runs. Thus, electrical continuity of the autopilot wire bundle runs throughout the airframe was not possible. The avionics and autopilot wiring was examined in many places accessible throughout the fuselage and the wiring was observed to be in a like new condition, with soft supple insulation. A very detailed examination of the wiring bundles and connectors behind the instrument panel was conducted during this process. Visual examination of the autopilot system wiring bundle connectors, both in the cockpit and in the avionics bay racks aft of the pressure bulkhead, disclosed that all the wires were securely attached to pins. A multimeter was used to verify that no ground faults existed in any wiring bundle from the connector pins to the points of severance.

Wire bundles containing conductors for other aircraft systems were randomly examined during the course of the wreckage examination. No evidence of insulation deterioration, excessive current flow, or arcing was observed.

The starter generators were taken to an FAA approved repair station authorized to overhaul the units. Impact damage precluded functional testing. Disassembly revealed no evidence of internal anomalies that would have precluded power generation.

1.7.8 Gyroscopic Flight Instruments

The gyroscopic flight instruments from the cockpit right side and the turn indicator from the left side were disassembled for examination. The right side instruments consisted of an electrically driven turn indicator, and air driven attitude and heading indicators. The turn indicator from the left side was electrically driven. All the instruments examined had sustained crushing damage to various degrees. All exhibited gyro wheel to housing scoring (360 degrees) on both the wheels and in matching locations within the wheel housings.

1.7.9 Fuel Samples

A sample of fuel was obtained from the right wing at the accident site and from the truck that had refueled the airplane the day before the accident. In both cases, only about a pint of fuel remained for the samples, an amount which does not allow for a full range of tests. The samples were submitted to a laboratory that performs quality tests for the petroleum industry. Based on the quantity available in the samples, "Distillation Distillates" tests were performed on both samples in comparison to specification ASTM D-2887 (Jet A). The distillation slope of both samples closely matched the Jet A specification.

1.7.10 Engine Teardowns

Both engines were removed from the airframe and transported to a Pratt & Whitney of Canada service center where they were disassembled under Safety Board supervision for detailed internal examination. The data plates on both engines were found to match the information contained in the maintenance records. No preimpact anomalies were found during the examinations. Internal rotational scoring was found in both engines consistent with engine operation above idle speed at impact.

1.7.11 Propeller Teardown Examinations

Both of the McCauley 4HFR34C762 propeller assembles were shipped to the McCauley factory where they were examined under Safety Board supervision on May 8-9, 2002. The complete report of this examination is contained in the docket material for this accident. In pertinent part, the report concluded that both propellers were rotating at high rpm at ground impact and neither propeller was in feather. Internal witness marks found inside the hubs indicated that the right propeller was operating at a blade angle of about 25 degrees, while the left was at an operating angle slightly higher.

1.7.12 Metallurgical Examination of Main Wing Spars

The main front and aft spars were sectioned near the primary fractures and these pieces were submitted to a laboratory for metallurgical analysis to confirm the material properties, chemistry, and fracture mode. The complete report is contained in the docket material for this case. In pertinent part, the report concludes that the spar failures were due to overload fractures. The metal chemistry and hardness values were found to agree with AMS 2658 specification for 7075-T76 aluminum alloys.

1.7.13 Left and Right Cockpit Annunciator Panels

The left and right cockpit annunciator caution/advisory light panels were removed from the instrument panel and sent to the Safety Board's Materials Laboratory for analysis of the light bulb filaments. The complete laboratory report is contained in the docket for this accident.

With the exception of the bulbs in the "L Hyd Flow Low" and "W/S Deice" positions, the remaining bulb filaments were broken. The filaments in the "L Hyd Flow Low" and "W/S Deice" positions were found to be stretched.

According to the Cessna 425 Pilot Operating Handbook, both of these positions contain system advisory lights. "L Hyd Flow Low" illuminates when the hydraulic fluid flow from the left pump is insufficient. "W/S Deice" illuminates to advise the pilot that the windshield heater elements have current flow.

1.7.14 Autopilot Components

On May 30, 2002, a Safety Board investigator and manufacturer representatives observed the examination and testing of the autopilot system that was removed from the airplane, N444JV. The examinations were conducted at the facilities of Sigma-Tek in Augusta, Kansas. In pertinent part, the examination found minor deviations from specifications for some components, but no significant anomalies. A complete report detailing each of the autopilot components examined is in the docket for this accident.

The ARC Autopilot Mode Selector (P/N: S-1050A-1; S/N: 412) was found impact damaged and bent. The unit was powered by test equipment with the following results: AP and FD (flight director) would not engage, LOC (localizer) would engage. The light bulbs from the push-button switches were removed and examined under a microscope with the following results:

Button	Condition
FD (white)	One stretched and broken; One stretched
FD	Both broken
AP	One intact; One broken
GA	One intact; One some stretch
VOR	One stretched; One broken
LOC	Both intact
HDG (white)	One stretched; One stretched and broken

HDG	One broken w/ some stretch; One Intact
NAV	Both stretched and intact
NAV (ARM)	Intact
NAV (ENG)	Intact
NAV 1	Both stretched; NAV 1 button selected
NAV 2	One intact; One broken
ALT (white)	Both broken
ALT	One broken; One bulb base broken w/ filament broken
GS	One burned out, black; One broken
GS (ARM)	Intact
GS (ENG)	Intact
BC (white)	One intact w/ stretching; One burned out, black
BC	Both intact

1.7.15 Vehicle Performance Study

The Safety Board's Office of Research and Engineering, Vehicle Performance Division, conducted a performance study of the aircraft's flight path and dynamic motion. Data used for the study included radar data from Moffett Federal Airfield (NUQ), aerodynamic data from the aircraft manufacturer, atmospheric data from the Oakland sounding, and the Air Traffic Control (ATC) transcript from the Federal Aviation Administration's Bay Terminal Radar Approach Control (TRACON). This study uses the available data to establish an estimate of aircraft's flight path and performance prior to the accident using plots of various parameters such as ground track, altitude, speeds, rates, angles, and vertical acceleration. ATC communications are also used to study operational aspects of the accident flight.

The complete performance report is included in the docket for this accident and contains graphic plots of the data. Figure 1 depicts the aircraft's ground track as north/south and east/west position with the NUQ ASR-9 antenna as the origin. In figure 2, the ground track is overlaid onto a topographical map to show the relationship of the ground track with the surrounding topography. Figure 3 shows the ground track of N444JV with ATC voice excerpts, where figure 4 shows the last 3 minutes with magnetic headings, altitude, and time displayed along the ground track. Figure 5 is a three dimensional depiction of the flight path. The Mode C radar altitude (ALT) versus time is plotted in figure 6. The vertical speed (VS) was derived from the smoothed altitude data and is plotted in figure 7. ALT and VS for the last 2 minutes 18 seconds is plotted in figure 8. Smoothed true, calibrated, and ground speed versus time are plotted in figure 9, including markings for the various airspeed limitations. The derived roll angle, pitch angle, and angle of attack, along with the roll rate and the body axis roll rate are plotted in figure 10. Figure 11 depicts the vertical and longitudinal load factor imposed on the vehicle during the flight.

The results of the study indicate that the accident airplane was cleared to 13,000 feet via radar vector to airway V485, and was climbing about 2,000 feet per minute (fpm) through 6,700 feet when it began a series of heading and altitude changes that were not consistent with its ATC clearances. The airplane turned right and climbed to 8,600 feet, then turned left and descended to 8,000 feet. The airplane then turned right and climbed to 8,500 feet, where it began a rapidly descending right turn. At 1034:33, as the aircraft was descending through 7,000 feet, the pilot advised ATC "four Juliet victor I just lost my needle give me..." No further transmissions were received from the accident airplane and the last radar return showed it descending through 3,200 feet about 11,000 fpm.

The vertical speed (VS) was derived from the smoothed altitude data. The normal rate of climb for this model aircraft at an altitude of 8,000 feet, weighing 7,800 pounds, outside air temperature at 1 degree Celsius with landing gear and flaps up is about 2,000 fpm. During the climb to 13,000 feet, 1 minute 50 seconds before the crash, N444JV's maximum climb rate reached approximately 6,000 fpm. Smoothed true, calibrated, and ground speed versus time were computed and show the speed beginning to decelerate at 1033:20, and concurrently the vertical speed begins to increase to its peak of 6,000 fpm, an indication of exchange of speed for altitude.

The derived roll angle, pitch angle, and angle of attack, along with the roll rate and the body axis roll rate were computed to show if tight/steep turns were made during the flight. The vertical and longitudinal load factors imposed on the vehicle during the flight were also computed. The increase in oscillation and subsequent divergence of the load factor begins about the time the accident plane starts to intercept V485 and begins its heading and altitude changes.

In terms of vertical speed, the rate of climb is nominal for the expected performance until the airplane passes through 6,500 feet msl. Over a 40-second period, the vertical speed increases from +1,500 to +3,000 fpm, then decreases to zero. In the next 20 seconds it increases back to +1,500, which is followed by a rapid decrease to +500 fpm. The vertical speed then achieves a rapid spike to +5,500 fpm, with a rapid reversal to -2,100, then back to +1,500 before it rapidly falls off to -16,500 fpm in the terminal descent.

The computed true airspeed was derived by factoring in the observed winds aloft with the radar-derived ground speed. Over the last 2 minutes of flight (after leaving 6,500 feet msl), the speed varies from 180 knots back to 140 knots in 30 seconds, then increases back to 175 and reverses back to 120 knots. Over the next 20 seconds, the speed increases to 205 knots, followed by a quick reduction to 190, then a rapid increase to 220 knots at the time of the last Mode C altitude report. According to Cessna, the maximum operating speed (Vmo) of the 425 is 230 knots.

Concerning roll angles and rates of roll, until the aircraft passes through 6,500 feet msl, the bank angles are less than 20 degrees and roll rates are 1 degree/second. After 1032:30, roll angles achieved are 30 degrees or greater with roll rates at 3 degrees/second or higher. At 1034:30, in the terminal descent, the airplane achieves a 78-degree bank angle at a roll rate of 6 degrees per second.

The computed vertical load factor remains between 0.9 and 1.25 g's up until 1033:30. After that time, the load factor rapidly oscillates between 0.75 and 2.3 g's.

1.8 MEDICAL AND PATHOLOGICAL INFORMATION

The pilot sustained fatal injuries in the accident and the Santa Clara County Medical

Examiners Office conducted an autopsy, with tissue and fluid samples retained for toxicological examination. The toxicological tests were performed by the FAA Civil Aeromedical Institute, Oklahoma City, Oklahoma. The test results were negative for alcohol and all screened drug substances.

1.9 ADDITIONAL INFORMATION

Other than the components retained for further examination, the balance of the wreckage was released to the insurance company representing the pilot's estate on April 10, 2002. All parts and components retained for examination were released from the Safety Board control and returned to the location of the wreckage between that date and March 15, 2004.

Pilot Information

Certificate:	Foreign; Private	**Age:**	62, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 3 Valid Medical--w/ waivers/lim.	**Last FAA Medical Exam:**	08/02/2000
Occupational Pilot:		**Last Flight Review or Equivalent:**	01/06/2002
Flight Time:	4987 hours (Total, all aircraft), 86 hours (Last 90 days, all aircraft), 29 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N444JV
Model/Series:	425	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	No
Airworthiness Certificate:	Normal	**Serial Number:**	425-0013
Landing Gear Type:	Retractable - Tricycle	**Seats:**	7
Date/Type of Last Inspection:	03/05/2002, Continuous Airworthiness	**Certified Max Gross Wt.:**	8600 lbs
Time Since Last Inspection:	2 Hours	**Engines:**	2 Turbo Prop
Airframe Total Time:	4315 Hours at time of accident	**Engine Manufacturer:**	Pratt & Whitney Canada
ELT:	Installed, not activated	**Engine Model/Series:**	PT6A-135A
Registered Owner:	Henry Guenther Trustee	**Rated Power:**	750 hp
Operator:	Henry Guenther	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument Conditions	**Condition of Light:**	Day
Observation Facility, Elevation:	SJC, 58 ft msl	**Distance from Accident Site:**	14 Nautical Miles
Observation Time:	1053 PST	**Direction from Accident Site:**	303°
Lowest Cloud Condition:	Few / 900 ft agl	**Visibility**	10 Miles
Lowest Ceiling:	Broken / 4000 ft agl	**Visibility (RVR):**	
Wind Speed/Gusts:	8 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	210°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.98 inches Hg	**Temperature/Dew Point:**	16°C / 9°C
Precipitation and Obscuration:			
Departure Point:	San Jose, CA (RHV)	**Type of Flight Plan Filed:**	IFR
Destination:	La Paz (MMLP)	**Type of Clearance:**	IFR
Departure Time:	1029 PST	**Type of Airspace:**	Class B

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	2 Fatal	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	3 Fatal	**Latitude, Longitude:**	37.181111, -121.746944

Administrative Information

Investigator In Charge (IIC):	JEFF RICH	**Report Date:**	06/02/2004
Additional Participating Persons:	Shawn Skaggs; Federal Aviation Administration; San Jose, CA Robert August; Cessna Aircraft Company; Wichita, KS Paul Crosby; Pratt & Whitney Canada; Longueuil, Quebec,,		
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.ntsb.gov/pubdms/.		

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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.