National Transportation Safety Board
Aviation Accident Final Report

Location:	BRANSON, MO	**Accident Number:**	CHI00FA040
Date & Time:	12/09/1999, 1512 CST	**Registration:**	N525KL
Aircraft:	Cessna 525	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	6 Fatal
Flight Conducted Under:	Part 91: General Aviation - Business		

Analysis

Prior to takeoff from Lambert Field/St. Louis International Airport, St. Louis, Missouri, the pilot contacted the operations manager at M. Graham Clark Airport, Point Lookout, Missouri, and asked about the current weather conditions there. The operations manager told the pilot that the weather was "pretty poor." The airplane took off from St. Louis, at 1411 cst. At 1447:12 cst, the pilot checked in with Springfield Approach Control. The pilot was told to expect the ILS approach to runway 2 at the Springfield-Branson Regional Airport. At 1501:01 cst, the pilot requested to go to Point Lookout and shoot the GPS to runway 11. Springfield Approach instructed the pilot to descend to 3,000 feet msl and cleared him for the approach. At 1507:08 cst, Springfield radar showed the airplane crossing the initial waypoint at 3,000 feet msl, and turn to 116 degrees approach heading. At 1507:17 cst, the airplane descended to 2,500 feet msl. At 1508:51 cst, Springfield Approach cleared the pilot to change to advisory frequency. "Call me back with your cancellation or your miss." The pilot responded, "Okay we're, we're RAWBE inbound and we will call you on the miss or cancellation." The operations manager at M. Graham Clark Airport said that he heard the pilot on the airport's common frequency radio say, "Citation 525KL is RAWBE inbound on the GPS 11 approach." At 1509:01 cst, Springfield radar showed the airplane begin a descent out of 2,500 feet msl. The last radar contact was at 1509:48 cst. The airplane was five nautical miles from the airport on a 296 degree radial, at 2,100 feet msl. At 1530 cst, the operations manager heard Springfield approach trying to contact the airplane. The operations manager initiated a search for the airplane. At 1430 cst, the weather observation at the M. Graham Clark Airport was 300 feet overcast, rain and mist, 3/4 miles visibility, temperature 53 degrees F, winds variable at 3 knots, altimeter 29.92 inches HG. Approach minimum weather for the GPS RWY11 straight in approach to Point Lookout are a minimum ceiling of 600 feet and visibility of 1 mile for a category B aircraft. An examination of the airplane wreckage revealed no anomalies. The results of FAA toxicology testing of specimens from the pilot revealed concentrations of Doxepin in kidney and liver. The Physicians' Desk Reference states that "... drowsiness may occur with the use of this drug, patients should be warned of the possibility and cautioned against driving a car or operating dangerous machinery while taking the drug." The physician who prescribed the Doxepin to the pilot said that he was using it to treat the pilot's "irritable bowel" condition. According to his wife, the pilot had not slept well for several nights, up to the day of the accident, due to

problems he was having with the FAA. A friend, who spoke with the pilot just before the accident flight, confirmed the pilot saying "I haven't slept for three days." The friend stated further that the pilot "wasn't himself that day."

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: the pilot descended below the minimum altitude for the segment of the GPS approach. Factors relating to the accident were low ceilings, rain, and pilot fatigue.

Findings

Occurrence #1: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: APPROACH - FAF/OUTER MARKER TO THRESHOLD (IFR)

Findings
1. (C) PROPER ALTITUDE - NOT MAINTAINED - PILOT IN COMMAND
2. (F) FATIGUE(LACK OF SLEEP) - PILOT IN COMMAND
3. (F) WEATHER CONDITION - LOW CEILING
4. USE OF INAPPROPRIATE MEDICATION/DRUG - PILOT IN COMMAND
5. (F) WEATHER CONDITION - RAIN
6. PRESSURE INDUCED BY OTHERS - FAA INSPECTOR

Factual Information

HISTORY OF FLIGHT

On December 9, 1999, at 1512 central standard time (cst), a Cessna 525, N525KL, operated by an airline transport pilot, was destroyed when it impacted a hillside on the northwest edge of the city of Branson, Missouri, 4.3 statute miles from its destination, the M. Graham Clark Airport, Point Lookout, Missouri. A post-crash fire ensued. The pilot, pilot-rated passenger, and four passengers in the cabin section of the airplane, were fatally injured. Instrument meteorological conditions prevailed at the time of the accident. The business flight was being conducted under 14 CFR Part 91. An instrument flight plan was on file. The cross-country flight originated at St. Louis, Missouri, at 1411 cst.

At 1339 cst, the pilot contacted the Federal Aviation Administration Flight Service Station at St. Louis, Missouri, by telephone, and obtained a preflight weather briefing for an instrument flight rules (IFR) flight from St. Louis to Point Lookout. Following the briefing, he filed an IFR flight plan.

The operations manager at M. Graham Clark Airport said that the pilot, while on the ground at St. Louis, contacted him by telephone, at 1348 cst, inquiring what the weather was at the airport. The operations manager told the pilot that the weather was pretty poor and gave him the most-recent observation, which he took a few hours earlier. "He (the pilot) asked me if I could listen for him to call on the CTAF (common traffic advisory frequency) and take a weather observation at that time for him. About 2:40 [p.m. cst] he called me on CTAF and said he was about 10 or 15 minutes out. He asked me if I could call him back with a current weather in about 10 minutes." At this time, another pilot departing the airport in a Cessna 421, N1527G, gave the pilot a pilot report (PIREP) for the field.

The Cessna 421 pilot told the pilot of N525KL that the clouds were approximately 1,200 feet mean sea level (msl). The pilot of N525KL radioed the airport manager and told him to disregard the observation; he was going to Springfield, Missouri.

At 1411 cst, the Air Traffic Control Tower at Lambert Field/St. Louis International Airport, cleared N525KL for takeoff. One minute later, the pilot was instructed to contact departure control.

At 1447:12 cst, N525KL checked in with Springfield Air Traffic Control Tower (ATCT) Approach Control (henceforth, referenced as Springfield Approach Control), and stated that he was descending at pilot's discretion to 10,000 feet msl. Springfield Approach Control told the pilot to maintain 10,000 feet msl and expect the ILS approach to runway 2 at the Springfield-Branson Regional Airport.

At 1449:29 cst, Springfield Approach Control cleared N525KL to 6,000 feet msl. N525KL responded, "okay we're down to six thousand..."

At 1455:48 cst, Springfield Approach Control instructed N525KL to turn left to a heading of 200 degrees. N525KL acknowledged the instruction.

At 1456:30 cst, Springfield Approach Control issued to N525KL, "pilot's discretion descend and maintain four thousand." N525KL responded, "discretion to four thousand for Kilo Lima."

At 1501:01 cst, Springfield Approach Control instructed N525KL to descend and maintain

3,000 feet msl, and turn right to a heading of 280 degrees. N525KL responded, "Okay we have a request. Can you give us, we would like to try Point Lookout, the weather doesn't look that bad here now, and then, if we miss, we'll come back up with you." The Springfield Approach controller asked N525KL's pilot what kind of approach did he want. The pilot responded, "We'll take the GPS to [runway] one-one."

At 1501:32 cst, Springfield Approach Control instructed N525KL to "descend and maintain three thousand until RAWBE, cleared [for the] GPS [runway] one-one approach." N525KL responded, "Okay, we're down to three [thousand], and we're direct RAWBE, and we're programming that now."

At 1507:08 cst, the display of ASR-8 radar at Springfield Approach Control showed N525KL cross the RAWBE waypoint at 3,000 feet msl, and turn to a heading of 116 degrees magnetic.

At 1507:17 cst, Springfield Approach Control radar showed N525KL descending out of 3,000 feet msl.

At 1508:04 cst, Springfield Approach Control radar showed N525KL level off at 2,500 feet msl.

At 1508:51 cst, Springfield Approach Control said, "Citation five Kilo Lima, change to advisory frequency approved. Call me back with your cancellation or your miss." N525KL responded, "Okay we're, we're RAWBE inbound and we will call you on the miss or cancellation."

The operations manager at M. Graham Clark Airport said that he was at his desk in the airport operations office when he heard the pilot on the airport's common frequency radio say, "Citation 525KL is RAWBE inbound on the GPS 11 approach." The operations manager said he went to the door of the building to see if he could hear the airplane go missed approach. The weather was no better than it had been earlier. He listened for about 15 to 20 minutes, then went back in. He said that he thought he must have missed hearing the airplane and that the airplane probably went back to Springfield.

At 1509:01 cst, Springfield Approach Control radar showed N525KL begin a descent out of 2,500 feet msl.

At 1509:46 cst, N1101U, contacted Springfield Approach Control and inquired if N525KL had cancelled yet, or if he was still on the approach? Springfield Approach Control answered, "Still on the approach, I show him just at the final approach fix now."

At 1509:48 cst, Springfield Approach Control's last radar contact position for N525KL, showed the airplane 5 nautical miles (nm) from the M. Graham Clark Airport on a 296 degree radial from the airport, at 2,100 feet msl.

PERSONNEL INFORMATION

The pilot held an airline transport pilot certificate with airplane single and multi-engine land, and instrument ratings.

The pilot also held a certified flight instructor certificate (CFI) with privileges to instruct in single and multi-engine land, instrument airplanes.

The pilot was also designated by the FAA as a pilot-examiner for the private pilot, commercial pilot, airline transport pilot, and flight instructor certificates in single and multi-engine, instrument airplanes.

According to insurance records provided by the College of the Ozarks, and dated May 6, 1999,

the pilot reported having approximately 10,150 hours total flying hours. Trip reports, also provided by the college, showed the pilot had logged 328 hours in the Cessna 525.

According to FAA airman records, a type rating in the Cessna 525 was added to the pilot's airline transport pilot certificate on August 13, 1998. The FAA reported that the pilot had successfully completed a biennial flight review, in conjunction with the renewal of his pilot examiner authority, in a Beech BE-58, on November 10, 1999.

The pilot held a current second class medical certificate, with limitations. According to the Airman Medical Examiner's report, dated August 9, 1999, the pilot's medical certificate contained the statement, "Shall wear corrective lenses."

The pilot-rated passenger held a commercial pilot certificate with airplane single and multi-engine land, and instrument ratings. Federal Aviation Administration airman records showed the addition of the multi-engine rating on October 10, 1997.

The pilot-rated passenger also held a certified flight instructor certificate (CFI) with privileges to instruct in single and multi-engine land, instrument airplanes. The last reported renewal of this certificate was on November 8, 1997.

According to insurance records provided by the College of the Ozarks, and dated October 7, 1999, the pilot-rated passenger reported having approximately 965 hours total flying hours. The records also showed the pilot-rated passenger as having 75 hours in the Cessna 525.

The pilot-rated passenger held a current first class medical certificate, with no limitations, dated November 29, 1999.

AIRCRAFT INFORMATION

The airplane was owned and operated by the College of the Ozarks and was used for the school's business purposes.

The airplane was on a continuous maintenance program. A "Phase B" inspection conducted on October 30, 1999, showed the airplane having 753.0 total hours. Trip records provided by the College of the Ozarks showed that on December 6, 1999, the airplane had 781.5 total hours.

METEOROLOGICAL CONDITIONS

The weather surface observation for Harrison, Arkansas, 22 miles south of Point Lookout, for 1451 cst, was 200 feet broken, 900 feet overcast skies, 2 miles visibility, rain and mist, temperature and dew point 53 degrees Fahrenheit (F), winds 100 degrees at 6 knots, and altimeter 29.91 inches of Mercury (HG).

The weather surface observation for Springfield Missouri, 38 miles north of Point Lookout, for 1512 cst, was 2,200 feet broken, 6,000 feet overcast skies, 2 and 1/2 miles visibility, light rain and mist, temperature 53 degrees F, dew point 52 degrees F, winds 030 degrees at 5 knots, and altimeter 29.91 inches HG.

The weather observation for the M. Graham Clark Airport, taken at 1450 cst, was 300 feet overcast, rain and mist, 3/4 miles visibility, temperature 53 degrees F. winds variable at 3 knots, and altimeter 29.92 inches HG.

AIDS TO NAVIGATION

The Point Lookout/M. Graham Clark Airport has a Global Positioning System (GPS) approach

to runway 11. The initial waypoint, identified as RAWBE, is located 10 nautical miles west from the end of the runway. The published altitude at RAWBE is 3,200 feet msl. After crossing RAWBE, an aircraft proceeds along a 116 degree course, and is cleared to descend to 2,500 feet msl.

The aircraft must remain at or above 2,500 feet msl until crossing GARYY, the final approach fix, located 5 nautical miles from the end of the runway. After crossing GARYY, the aircraft can descend to a step-down altitude of 2,000 feet msl until reaching 3.2 nautical miles from the end of the runway. When the airplane reaches 3.2 nautical miles from the end of the runway, a pilot may descend to the minimum descent altitude (MDA) of 1,460 feet msl. The airplane must remain at or above the MDA until reaching BRENL, the missed approach point, located near the runway threshold.

On December 10, 1999, at 1325 cst, the FAA conducted a flight inspection of the GPS approach to runway 11 at the Point Lookout/M. Graham Clark Airport. All published waypoints and routing were flown. Flight inspection results were reported as satisfactory.

A follow-on flight inspection of the Airport Surveillance Radar (ASR-8), and Mode-S equipment at Point Lookout was conducted by the FAA on December 17, 1999, at 0945 cst. The inspection examined the intermediate approach segment between RAWBE and GARYY waypoints, and checked for general terrain alerts. A general terrain alert occurred 2.5 nautical miles prior to GARYY waypoint, between 2,100 and 2,000 feet msl. Flight inspection results were reported as satisfactory.

WRECKAGE AND IMPACT INFORMATION

The NTSB on scene investigation began on December 10, 1999, at 1230 cst.

The accident site was in Henning State Park, 1/2 mile north- northeast of Missouri Highway 76, and 1 mile west of Branson, Missouri. The accident site was situated on the west-northwest side of a wooded hill, beginning approximately 38 feet northwest of a 100 foot high observation tower which sat at the hill's peak elevation of 1,340 feet mean sea level (msl). The accident site extended west-northwest down the slope of the hill for approximately 250 feet. The accident site was also located 4.3 statute miles west-northwest of the M. Graham Clark Airport on a 290 degree magnetic course.

The accident site began with a 75 foot tall oak tree located approximately 283 feet west-northwest of the observation tower on a 296 degree magnetic heading. Several of the top branches ranging from 1 to 4 inches in diameter were sheared off and had fallen east of the tree. The height at which the branches were sheared off equalled an elevation which was approximately 100 feet lower than the top of the hill.

Over the next 128 feet, several smaller oak and fir trees were sheared off at locations progressively lower as the accident site progressed along a 116 degree magnetic heading. Tree trunks and branches were scattered along the damage path. Numerous small white paint chips and small metal pieces from the wing's leading edges were scattered among the trunks and branches.

The airplane's right wing tip was located 109 feet from the first damaged oak tree on a 120 degree magnetic heading. The wing tip was broken longitudinally along the rivet line. The left main landing gear inboard door was located 110 feet from the first oak tree on a 117 degree magnetic heading. It was broken out at the hinges. A 30 inch section of the airplane's right

horizontal stabilizer and elevator was located 110 feet from the first oak tree at a 113 degree magnetic heading. The piece was broken out and bent 75 degrees at mid-span. A piece of the right aileron and a 48 inch section of the right wing upper skin and aft spar was located 129 feet from the first oak tree on a 115 degree magnetic heading. The section was broken out and bent.

The airplane's right main landing gear was located 136 feet from the first oak tree on a 115 degree magnetic heading. It was broken aft above the fork, and showed heat and smoke damage.

A ground scar, 17 feet long and 10 feet wide, began 138 feet from the first damaged oak tree, and continued into the hillside until reaching an asphalt walking path, next to a 48 inch diameter, and approximately 60 foot tall fir tree. The fir tree was located 155 feet from the first damaged oak tree on a 116 degree magnetic heading. The fir tree was charred at the lower trunk and branches. The upper branches were scorched. A portion of the airplane's right wing was bent around the south side of the tree's trunk at the base. The wing piece was charred and melted.

Just south of the fir tree, rested the airplane's tail cone. It was broken off just aft of the engine mounts and was crushed inward. Resting south of the tailcone was the airplane's right engine, a portion of the lower aft fuselage containing the right engine mount and hydraulic reservoir, the top of the airplane's T-tail made up of the horizontal stabilizers and elevators, the rudder, and a 38 inch long, 30 inch wide section of skin from the aft fuselage. The T-tail top was broken off at the top of the vertical stabilizer. The outboard 18 inches of the right horizontal stabilizer and elevator were bent upward and broken off. The airplane's rudder remained attached to the T-tail at an upper hinge co-located with the top 8 inches of the vertical stabilizer's rear spar. The rudder was bent and twisted. The lower aft fuselage containing the engine mount was crushed inward and charred. The piece of fuselage skin was torn out laterally and longitudinally along rivet lines and bent inward.

The remainder of the airplane to include the majority of both wings, the left engine, cabin, cockpit, and nose section, was fragmented and scattered along a 116 degree magnetic heading for 75 feet. The airplane pieces rested within a burned wooded area, 82 feet long and 48 feet wide. Numerous oak and fir trees were knocked over, falling uphill along the 116 degree heading.

A large piece of the inboard part of the airplane's left wing was located 191 feet from the first damaged oak tree on a 116 degree magnetic heading. The wing was broken off at the wing root, fragmented, charred and melted. The airplane's left main landing gear rested with the wing. The gear strut and cylinder was charred and melted. The tire was consumed by fire.

The upper portion of the aft fuselage with the left engine, left engine pylon and base of the vertical stabilizer, was located 214 feet from the first damaged oak tree on a 114 degree magnetic heading. The section was broken open, charred and melted. The engine's cowlings were crushed upward and aft, and showed charring.

A 4 foot section of the right wing was located 229 feet from the first damaged oak tree on a 112 degree magnetic heading. The wing section showed charring and smoke damage.

The airplane's cabin section and most of the airplane's right wing rested within a burned area beginning 229 feet from the first damaged oak tree, and extending uphill for 13 feet. The cabin section was broken open, charred, melted, and consumed by fire. The wing section was also

broken open and showed heavy charring and melting.

The cockpit area began 239 feet from the first damaged oak tree on a 116 degree heading. The area consisted of the remains of the pilot's seats, copilot's side panel, the throttle quadrant and the instrument panel. The remainder of the cockpit, including the windscreen, fuselage walls, and control columns, were consumed by fire. Altimeters from both the pilot and copilot's instrument panel were located and examined. The copilot's altimeter was heavily charred and melted. The barometric pressure window in the copilot's altimeter showed 1013 millibars (mb). The Kolsman window showed an altimeter setting of 29.92 inches HG.

The nose section of the airplane and nose landing gear were located 245 feet from the first damaged oak tree on a 116 degree magnetic heading. The nose was oriented on a 190 degree magnetic heading. It was broken open, charred, and melted. The landing gear was charred and melted. The nose tire was consumed by fire.

The fire damaged area continued forward of the nose section for another 7 feet.

Flight control continuity was traced from the cockpit area through surviving wing and empennage sections to fractures at the control surfaces. The examination of the flight controls revealed complete continuity. Examination of the surviving airplane systems revealed no anomalies.

The airplane's engines, integrated avionics computer, and pilot's altimeter were retained for further examination.

MEDICAL AND PATHOLOGICAL INFORMATION

Autopsies of the pilot and pilot-rated passenger were conducted at the Greene County, Missouri, Medical Examiner's Office, Springfield, Missouri, on December 10, 1999.

The results of FAA toxicology testing of specimens received from the pilot revealed the following volatile concentrations:

0.376 (ug/ml, ug/g) Doxepin detected in Kidney. 0.134 (ug/ml, ug/g) Nordoxepin detected in Kidney. 4.169 (ug/ml, ug/g) Doxepin detected in Liver. 1.886 (ug/ml, ug/g) Nordoxepin detected in Liver.

The 1998 Physicians' Desk Reference (PDR) states that Doxepin Hydrochloride, marketed and prescribed under the commercial name Sinequan, "is one of the class of psychotherapeutic agents known as dibenzoxepin tricyclic compounds. Sinequan is recommended for the treatment of (1.) psychoneurotic patients with depression and/or other anxiety, (2.) depression and/or anxiety associated with alcoholism, (3.) Depression and/or anxiety associated with organic disease, and (4.) psychotic depressive disorders with associated anxiety including involutional depression and manic- depressive disorders. The target symptoms of psychoneurosis that respond particularly well to Sinequan include anxiety, tension, depression, somatic symptoms and concerns, sleep disturbances, guilt, lack of energy, fear, apprehension and worry."

Precautions stated in the PDR include that "... drowsiness may occur with the use of this drug, patients should be warned of the possibility and cautioned against driving a car or operating dangerous machinery while taking the drug."

Under dosage and administration, the PDR states, "For most patients with illness of mild to moderate severity, a starting daily dose of 75 mg is recommended. In patients with very mild

symptomatology or emotional symptoms accompanying organic disease, lower doses may suffice. Some of these patients have been controlled on doses as low as 25-50 mg/day."

The physician who prescribed the Doxepin to the pilot said that the drug had been around for 40 years and did not possess much "mood elevating properties." He said that there are some secondary effects which the drug is used to treat, as "irritable bowel." The physician said that he prescribed a small dose, 25 milligrams.

An entry, dated September 1, 1999, extracted from the notes maintained on the pilot, by his gastroenterologist stated, " ... patient ... started on Doxepin 25 mg at bedtime ..." The pilot filled his prescription for Doxepin (30 capsules of 25 mg each, to be taken one at bedtime) only once, on November 12, 1999. See Medical Officer's Factual Report.

The Manager of the FAA Toxicology and Accident Research Laboratory said that Nordoxepin is the metabolite of Doxepin.

The results of FAA toxicology testing of specimens received from the pilot-rated passenger revealed the following volatile concentrations:

0.037 (ug/ml, ug/g) Tetrahydrocannabinol (Marihuana) detected in Liver. 0.095 (ug/ml, ug/g) Tetrahydrocannabinol Carboxylic Acid (Marihuana) detected in Liver. 0.014 (ug/ml, ug/g) Tetrahydrocannabinol Carboxylic Acid (Marihuana) detected in Urine.

The Manager of the FAA Toxicology and Accident Research Laboratory said that based on the volatile concentration level of the parent drug, Tetrahydrocannabinol, detected in the liver, it is probable that use of the drug occurred anywhere from 2 hours to within 8 hours of the accident.

The Tetrahydrocannabinol Carboxylic Acid detected in the liver and urine is the metabolite of Tetrahydrocannabinol.

FIRE

The airplane was located at 1821 cst, when a Branson Police officer discovered flames coming from the wooded area to the east of Henning State Park. "We located the remains of an aircraft, about 100 yards north of MO 76. The debris was scattered across a large area. Several pieces of the debris were still on fire..." At 1822 cst, the call was sent out for emergency units to respond to the accident site. Local fire department and emergency medical services personnel arrived on the scene shortly after the call was made.

SURVIVAL ASPECTS

At 1530 cst, the operations manager at the M. Graham Clark Airport, heard Springfield Approach control trying to contact N525KL. The operations manager said that at 1600 cst, he notified the College of the Ozarks and drove around the perimeter of the airport to see if the airplane had landed short or long. At 1700 cst, the search began in earnest. At 1730, the Taney County dispatch center broadcast a message to all law enforcement agencies, including the Branson Police, Fire, and ambulance agencies, that a search for a missing airplane was on.

TESTS AND RESEARCH

The engines were examined at Williams International's Product Support Division, Detroit, Michigan, on January 6 and 7, 2000. The examination revealed no pre-impact anomalies to either engine.

The airplane's integrated avionics computer (part number 7017000, serial number 94090355) was examined at Honeywell, Incorporated, Scottsdale, Arizona, on January 13, 2000. The examination revealed that the circuit cards were "mechanically and thermally damaged. U39, the memory chip that could have contained data from the flight, was severely damaged and no data was salvageable."

The pilot's altimeter was examined at the National Transportation Safety Board's Materials Laboratory, Washington, DC, on January 20, 2000. The examination of the counter drums revealed that the display numbers on the reverse side of the counter were "6568" and the displayed numbers on the reverse side of the bottom counter were "7448". "The reverse of these numbers (displayed on the front of the counters) should therefore be "1013" for the top counter and "2993" for the bottom counter." See Materials Laboratory Factual Report.

According to the airplane manufacturer, the N525KL was equipped with a KLN 90B global positioning system approved for use in instrument meteorological conditions under provisions specified in Department of Transportation, Federal Aviation Administration, Technical Standard Order (TSO) C129, "Airborne Supplemental Navigation Equipment Using the Global Positioning System (GPS)", December 10, 1992. The KLN 90B GPS installed in the airplane was certified to equipment Class A1. TSO C129 states Class A covers equipment incorporating both GPS sensor and navigational capability, and Receiver Autonomous Integrity Monitoring (RAIM). Class A1 covers equipment approved for en route, terminal, and non-precision approach (except localizer, localizer directional aid) use, and simplified directional facility navigational capability. For accomplishment of non-precision approaches, Class A1 equipment shall provide the following:

a.) At a radial distance of 30 nm from the destination airport, the equipment shall provide an approach enable alert. After display of the alert, a means shall be provided to enable the approach mode with a single action by the pilot. The approach mode shall not engage unless previously enabled by the pilot.

b.) Upon activation of the approach mode, the equipment shall provide a smooth transition from 5 nm non-numeric display sensitivity to 1 nm sensitivity.

c.) At a distance of 3 nm inbound to the final approach fix, the equipment shall provide an annunciation indicating an automatic non-numeric display sensitivity change will occur.

d.) At a distance of 2 nautical miles inbound to the final approach fix, the equipment shall provide a linear transition from 1 nm non-numeric display sensitivity to 0.3 nm sensitivity at the final approach fix.

According to the airplane manufacturer, a green annunciator light illuminating accompanies the change of GPS mode from en route to approach.

The pilot served as the Director of Aviation Science at the College of the Ozarks. According to the 1999-2000 College Catalog, the Aviation Science program prepares students to become Aviation Maintenance Technicians, qualifies students for certification by the FAA as Aviation Maintenance Technicians with Airframe and Powerplant ratings, and assists those students involved in the aviation industry with additional training as necessary to meet current demands in the field of air transportation. The program enrolls approximately 72 students total, and accepts 24 students into the program at the beginning of each fall semester. The pilot's duties as director included curriculum development and implementation, oversight of the college's maintenance school program, oversight of the 14 CFR Part 61 flight school,

counseling and advising students, and managing the department's faculty and staff.

Additionally, the pilot was the manager of the M. Graham Clark Airport. Responsibilities assigned under the airport manager's duties included parking and servicing transient aircraft, facilities management, hangar rentals, car rentals, fueling of aircraft, rental of the college's airplanes, oversight of the 14 CFR Part 145 aircraft repair station, weather observation, fire and emergency operations, managing the airport staff, and overseeing special airport projects. The pilot was responsible to the college administration for the Aviation Science school budget and the budget covering the operation of the airport. Prior to the accident, the pilot was involved in preliminary negotiations of a contract designed to move and extend the airport's runway.

The pilot was also a designated pilot examiner and administered all of the students' private pilot checkrides. The pilot also administered check flights for additional ratings in airplanes.

The pilot was the only person at the college qualified to pilot the Cessna 525 airplane, at the time of the accident. Between the time the college received delivery of the airplane, in August, 1998, and the time of the accident, the pilot logged 328 hours in the airplane. Flights in the airplane consisted of cross-country trips transporting the college's president, staff, and distinguished visitors to the college, to and from locations all over the country.

Interviews with several members of the college's staff and faculty, and students, revealed that college's administration and staff were aware of the pilot's workload. They described it as the pilot having "a full plate."

In the 9 months prior to the accident, the pilot had personally responded to, on behalf of the college, enforcement action taken against the part 145 repair station, by the Kansas City Flight Standards District Office (FSDO). This followed a March 10, 1999, inspection, which revealed several deficiencies on the college's part to adequately monitor, document and perform required maintenance on its airplanes.

The pilot also dealt with an FAA enforcement action taken against one of the school's mechanics.

On March 24, 1999, the pilot received a letter from the FAA Kansas City FSDO stating, "On March 10, 1999, an inspector from this office reviewed the maintenance records of several aircraft under your control. The results of this review gives reason to believe that a re-examination of your airman competency is necessary ... The re-examination will consist of appropriate airline transport pilot practical test areas with emphasis on determining the maintenance requirements, tests, and appropriate records applicable to the proposed flight operation." On March 29, 1999, the pilot appealed the action to the FAA Central Regional Headquarters, in Kansas City, Missouri. On April 15, 1999, the pilot received another letter from the Kansas City FSDO stating that the March 24, 1999, letter was rescinded.

On November 24, 1999, 15 days prior to the accident, the pilot received a letter from the Kansas City FSDO stating, "It has come to our attention that you have recently administered two practical tests in multi-engine airplanes without the appropriate class rating on your Certificate of Authority and without a Letter of Authorization for the specific make and model of multi-engine airplane." " ... we are investigating these occurrences and wish to offer you the opportunity to provide a written statement regarding this matter. This letter also constitutes a reasonable request ... that you provide this office with your pilot logbook(s)."

According to the pilot's wife, in the days following receipt of the November 24, 1999, FAA

letter, the pilot contacted an aviation attorney and began drafting a response to the FAA's action. She said that in the 72 hours prior to the day of the accident, her husband "was distressed by the FAA harassment." He wanted to know why the Kansas City FSDO wanted his pilot logbook.

He wanted to know what they could do to him and what their agenda was. "He was concerned about the disgrace that this could bring to the college, as well as to himself." He contacted a friend for advice and counsel, and he contacted the two individuals whom he had administered the multi-engine checkrides to, which were the subject of the FAA's November 24, 1999, letter, and apologized to them. "He told them that he would refund their money and assist them in finding another check pilot. He was embarrassed about it." She could tell it bothered him. The pilot's wife said that he was not dealing with the stress well. "There were a lot of sleepless nights." The night before the accident, the pilot got to bed "around 10:30 to 11:00 p.m." That evening they were working on a draft letter to the attorney.

On the evening of December 8, 1999, at 1845 cst, a Cessna 172M, N69LM, owned and operated by the College of the Ozarks and piloted by one of the college's students, was involved in an accident at Ava, Missouri, resulting in minor injuries to 2 passengers. A witness reported that this event was weighing heavily on the pilot's mind.

On the morning of the accident, the pilot's wife said that he was up before she was. She said that it was unusually early for him to be up. The pilot's wife said that she has to be up by 5:00 a.m., in order to leave their home at 6:15 a.m., to drive to her teaching job near Springfield, Missouri.

Several school faculty members and students said they saw the pilot on the morning of the accident, prior to the flight from Point Lookout to St. Louis. One witness said that when he arrived at the airport, at 0825 cst, the pilot was in the hangar performing the preflight inspection on the jet. The pilot expressed to the witness that they were trying to beat the weather moving into St. Louis. The witness said he watched the pilot and passengers get on the jet. Another witness said that he saw the pilot and passengers before they took off. The witness said that the pilot "was calm that day; more calm than usual. I spoke with him briefly; he was jovial. It was unusual. He would not have been that calm with the way the weather was. It was zero-zero here, dense, all the way to the ground." A third witness said that she saw the pilot before they departed. "He was working on a safety report. I asked how he was? He said he was fine." A fourth witness encountered the pilot while he was looking at the weather. The witness said the pilot was in a good mood and expressed no concerns about the flight. The witness said, "I asked him if the jet cares about weather?" The pilot responded, they'd be fine.

A corporate operator and friend of the pilot said that he met the pilot, after the pilot's airplane landed at St. Louis. The pilot introduced the pilot-rated passenger, who was with him, to his friend and then said, "... I need to talk to you." The friend said they went into the fixed base operator at St. Louis, and talked for an hour and a half. The friend said that the pilot "wasn't himself that day." He said that the pilot told him that he hadn't slept for three days, and expressed that a supervisor in the Kansas City FSDO "is trying to destroy me." He said that the FSDO had "subpoenaed his logbooks back to the beginning." The friend said that the pilot was really stressed. "I was concerned about his physical health that day." The friend said that the pilot was obsessed with the logbook issue. He couldn't understand why the FAA wanted all of his logbooks. The pilot told him that he had contacted an attorney and took the logbooks to him. "I tried to change the subject during our conversation, but couldn't get him off it. He was

staring into space. He was visibly upset, antsy. His face showed the lack of sleep. He said that they (FAA) were out to destroy him and his position at the college. He was worn out." The friend said the pilot's airplane departed in front of his airplane. The pilot "was in the left seat. The kid was in the right seat. They taxied out before me."

Interviews with supervisors and inspectors in the Kansas City Flight Standards District Office revealed that their perception of the relationship between the FAA and the College of the Ozarks had deteriorated through 1999. One supervisor said of the college, "They are very proud ... They don't receive any government money. They would rather you (the Federal Government) weren't here." An FAA inspector said, "the folks down there didn't like us roaming around." Another inspector said that the pilot controlled all of the aviation activities at the college. "He ran the place with a tight fist. He had the final say with regard to everything." The inspector also said that the school showed a "strong dislike of the FAA."

College administration and staff indicated that they were aware of some problems between the pilot and the FAA, but said that the pilot indicated that he could handle it. They also indicated that they were aware of the pilot's workload. When asked by one administrator if he could use some help at the airport, the pilot was said to have responded along the lines of, "What, do you think I'm not doing my job?"

ADDITIONAL INFORMATION

Parties to the investigation were the Federal Aviation Administration, the Cessna Aircraft Company, Williams International, and the College of the Ozarks.

All of the airplane wreckage was released and returned to Associated Aviation Underwriters, Incorporated, Overland Park, Kansas.

Pilot Information

Certificate:	Airline Transport; Flight Instructor	**Age:**	54, 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):	Airplane Multi-engine; Airplane Single-engine; Instrument Airplane	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 Valid Medical--w/ waivers/lim.	**Last FAA Medical Exam:**	06/14/1999
Occupational Pilot:		**Last Flight Review or Equivalent:**	
Flight Time:	10150 hours (Total, all aircraft), 328 hours (Total, this make and model), 9950 hours (Pilot In Command, all aircraft), 2 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N525KL
Model/Series:	525 525	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	No
Airworthiness Certificate:	Normal	**Serial Number:**	525-0136
Landing Gear Type:	Retractable - Tricycle	**Seats:**	6
Date/Type of Last Inspection:	10/30/1999, Continuous Airworthiness	**Certified Max Gross Wt.:**	11500 lbs
Time Since Last Inspection:	30 Hours	**Engines:**	2 Turbo Jet
Airframe Total Time:	783 Hours	**Engine Manufacturer:**	Williams Intl
ELT:	Installed	**Engine Model/Series:**	FJ44-1A
Registered Owner:	COLLEGE OF THE OZARKS	**Rated Power:**	1900 lbs
Operator:	COLLEGE OF THE OZARKS	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument Conditions	**Condition of Light:**	Day
Observation Facility, Elevation:	HRO, 1364 ft msl	**Distance from Accident Site:**	25 Nautical Miles
Observation Time:	1451 CST	**Direction from Accident Site:**	157°
Lowest Cloud Condition:	Unknown / 0 ft agl	**Visibility**	2 Miles
Lowest Ceiling:	Broken / 200 ft agl	**Visibility (RVR):**	0 ft
Wind Speed/Gusts:	6 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	100°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29 inches Hg	**Temperature/Dew Point:**	53°C / 53°C
Precipitation and Obscuration:			
Departure Point:	ST. LOUIS, MO (STL)	**Type of Flight Plan Filed:**	IFR
Destination:	POINT LOOKOUT, MO (PLK)	**Type of Clearance:**	IFR
Departure Time:	1411 CST	**Type of Airspace:**	Class E

Airport Information

Airport:	M. GRAHAM CLARK AIRPORT (PLK)	**Runway Surface Type:**	Asphalt
Airport Elevation:	938 ft	**Runway Surface Condition:**	Wet
Runway Used:	11	**IFR Approach:**	
Runway Length/Width:	3739 ft / 100 ft	**VFR Approach/Landing:**	

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	5 Fatal	**Aircraft Fire:**	On-Ground
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	6 Fatal	**Latitude, Longitude:**	

Administrative Information

Investigator In Charge (IIC):	DAVID C BOWLING	**Report Date:**	06/12/2001
Additional Participating Persons:	ROMAN A BUETTNER; KANSAS CITY, MO HENRY J SODERLUND; WICHITA, KS DENNIS J WOODCOX; WICHITA, KS HOWELL W KEETER; POINT LOOKOUT, MO		
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/.		