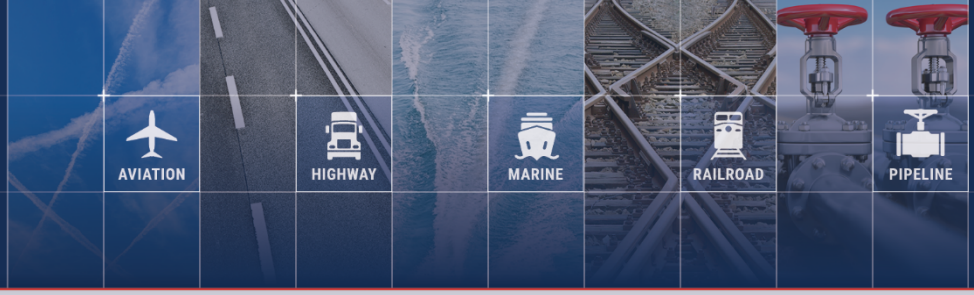

Aviation Investigation Final Report

Location:	OLATHE, Kansas	**Accident Number:**	CHI93DCG01
Date & Time:	June 13, 1993, 09:27 Local	**Registration:**	N222EG
Aircraft:	EMORY W. GREER, JR. VARI-EZE	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	2 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

WITNESSES DESCRIBED SEEING THE AMATEUR BUILT AIRPLANE MAKE A NORMAL TAKEOFF AND INITIAL CLIMB. SHORTLY AFTER TAKEOFF, THEY STATED THAT THE ENGINE NOISE INCREASED TO AN EXTREMELY HIGH RPM AND THEN STOPPED ALTOGETHER. THE PILOT MADE A STEEP, DESCENDING TURN AFTER THE ENGINE STOPPED AND THE ACFT COLLIDED WITH TERRAIN. POSTACCIDENT INSPECTION DISCLOSED A SHATTERED PROPELLER WHICH WAS RECOVERED SOME DISTANCE FROM THE ACCIDENT SITE, AND A MISSING FUEL CAP FROM THE RIGHT WING TANK. THE FUEL CAP WAS FOUND LATER IN THE INVESTIGATION WELL AWAY FROM THE CRASH SITE AND WAS HEAVILY ABRADED. THE FUEL CAP WAS UNLATCHED AND WAS NOT SECURED TO THE TANK WITH A SAFETY CHAIN. THE FUEL TANK IS LOCATED AHEAD OF, AND IN LINE WITH, THE PUSHER ENGINE AND PROPELLER ASSEMBLY.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: the pilot's failure to secure a fuel cap during the preflight inspection of the airplane, and the pilot's failure to maintain aircraft control during the emergency landing. Factors associated with the accident are the unsecured fuel cap and the foreign object (fuel cap) damage to the propeller blades.

Findings

Occurrence #1: AIRFRAME/COMPONENT/SYSTEM FAILURE/MALFUNCTION
Phase of Operation: TAKEOFF - INITIAL CLIMB

Findings
1. (F) FUEL SYSTEM,CAP - NOT SECURED
2. (F) PROPELLER SYSTEM/ACCESSORIES,BLADE - FOREIGN OBJECT DAMAGE
3. (C) AIRCRAFT PREFLIGHT - IMPROPER - PILOT IN COMMAND

Occurrence #2: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: MANEUVERING - TURN TO LANDING AREA (EMERGENCY)

Findings
4. (C) AIRCRAFT CONTROL - NOT MAINTAINED - PILOT IN COMMAND

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

Factual Information

HISTORY OF FLIGHT

On June 13, 1993, about 0927 central daylight time, a homebuilt Vari-Eze, N222EG, collided with the ground during a forced landing near the Johnson County Industrial Airport (IXD), Industrial Airport, KS. The pilot and passenger were fatally injured and the aircraft was destroyed upon impact. The aircraft was being piloted by its owner and builder, Emory W. Greer, Jr., on a VFR flight to Tuscaloosa, Alabama, with a fuel stop in Jonesboro, Arkansas. The aircraft had departed runway 17 at Johnson County Industrial Airport approximately one minute prior to the accident. Visual meteorological conditions prevailed at the time and a VFR flight plan was filed. The flight was conducted under CFR Part 91.

Witnesses reported that the airplane achieved an altitude of approximately 200-300 feet when a surge of engine speed was heard followed by a lack of engine sound. The airplane immediately entered a left descending turn with a steep descent angle. The bank angle and rate of descent continued unarrested to ground impact.

The aircraft impacted a vacant, plowed field approximately 1,000 feet east-northeast of the threshold of runway 35, on property adjacent to the airport. The fuselage disintegrated upon impact, scattering parts over a 160-foot swath. Both the pilot and passenger were ejected from the airplane and found about 130 feet from the initial point of impact.

INJURIES TO PERSONS

The pilot and passenger were fatally injured.

DAMAGE TO AIRCRAFT

Initial ground contact was with the left wingtip and left canard tip. Approximately 30 feet from that initial ground contact point the fuselage struck the ground and the aircraft began to break up. As the break up progressed, parts from the left side of the aircraft, such as the left wing root leading edge, left landing gear attach structure, left bottom cowl, left canard tip and left baggage pod were strewn along the path, followed by a propeller blade, the right baggage pod, wings, pieces of fuselage, seat cushions, the engine and it's attach structure, fuselage remnants and the nose wheel. The canard and main landing gear were found most distant, about 190 feet from the initial ground contact point.

The engine, its attach structure and remnants of the fuselage were found inverted and with the propeller oriented forward, opposite the normal (for a pusher) aft position. All cockpit engine controls had separated from the engine. The carburetor, gascolator bowl, air induction

hoses and oil cooler had been torn from the engine. Residual fuel was found in some of the lines and a fuel scent was present. There was no evidence of fire, pre-impact mechanical distress to the engine, or oil leaks.

Both blades of the wooden propeller had separated from the hub portion. While the remnants of one blade were found at the site, only partial remnants of the other blade could be found.

Both wing fuel tanks had been torn open and no fuel was found in either of them, although a fuel scent was present. The fuselage fuel tank was devoid of fuel, but its integrity could not be confirmed. As the wreckage came to a rest, the fuselage tank had been inverted. The fuel tank filler caps for the left wing and fuselage tanks were found securely in position in their adapter rings which were still attached to their tank structures. The adapter ring for the right fuel tank filler cap was still attached to the tank structure but the cap itself could not be located at the site.

The occupants were ejected from the aircraft as the attach points of their seatbelts failed and the structure disintegrated about them. The belts and harnesses themselves, however, were in excellent condition and still fastened. It was not possible to confirm the seats (front or rear) occupied by the pilot and passenger.

Most pieces and components showed evidence of abrasion or contact with dirt as the aircraft broke up. There was no evidence of in-flight or post-crash fire.

PERSONNEL INFORMATION

The pilot's name was Emory W. Greer, Jr., age 61. He held private pilot certificate number 001924012 with airplane single engine land category and class ratings, and aircraft repairman (experimental) certificate number 002441924. His pilot logbooks showed about 1,273 hours of flight time. He held a valid third class medical certificate issued June 24, 1992. He was to have glasses available for near vision. Mr. Greer's last flight review had been accomplished 47 months prior to the accident in a Cessna 172. His pilot logbook showed no dual instruction logged since his flight review.

The passenger's name was Dorothy Greer, wife of the pilot, Emory Greer, Jr. Mrs. Greer did not hold an airman certificate

AIRCRAFT INFORMATION

The aircraft was a homebuilt Vari-Eze, N222EG, serial number 914, constructed by the pilot over the period 1976- 1986, and was awarded a special airworthiness certificate on April 5, 1986. It was a tandem two-place, canard planform, designed by Burt Rutan, with fixed main landing gear and a retractable nose wheel. It was powered by a Lycoming 0-235 C2A, normally aspirated, four-cylinder, direct drive, air- cooled engine producing 115 horsepower. The engine

was mounted in the rear of the fuselage and powered a single, fixed-pitch wooden propeller in a pusher configuration.

There were two integral wing tanks, each fitted with a fuel filler and cap, with a fuel capacity of 12 gallons each. In addition, there was a header tank in the fuselage, fitted with a fuel filler and cap, with a fuel capacity of 2.5 gallons. All fuel was usable. 13 gallons of 100LL avgas were added to the aircraft just prior to departure, which filled the main tanks. The quantity of fuel in the header tank could not be determined. As the header tank is customarily used for a fuel reserve, it was assumed to be full.

The airframe and power plant were maintained in accordance with FARs. Total time on the airframe was approximately 1128 hours. An annual inspection had been performed by the owner/builder, Mr. Greer, on May 30, 1993. The placarded empty weight of the aircraft was 750 pounds, and the placarded maximum gross weight was 1,100 pounds. The aircraft logbook gave the same description.

Assuming an aircraft basic empty weight of 750 pounds and a full fuel weight of 159 pounds (26.5 gallons x 6 pounds per gallon), a payload of 191 pounds remains. The pilot's medical certificate showed his weight as 154 pounds, leaving only 37 pounds remaining for his wife and baggage before the placarded maximum gross weight was exceeded. Assuming a passenger weight of 125 pounds and baggage weight of 25 pounds, the takeoff weight off the airplane would have been 1,213 pounds.

METEOROLOGICAL INFORMATION

The reported weather at Johnson County Industrial Airport, taken at a special observation at approximately 0930 central daylight time, was 1,300 scattered, estimated ceiling 12,000 broken, visibility 8 miles, temperature 72 degrees, dew point missing. The wind was 180 degrees at 12 knots and the altimeter setting was 30.04. Visual meteorological conditions prevailed throughout the area.

COMMUNICATIONS

N222EG was cleared by Johnson County Industrial Air Traffic Control Tower to taxi to Executive Beechcraft at 0850, and called again at 0917 for taxi clearance. The aircraft was cleared for takeoff at 0926 and the pilot acknowledged the clearance. There were no further communications with the aircraft from after takeoff to ground impact.

WRECKAGE AND IMPACT INFORMATION

On-scene evidence suggested initial ground contact was with the left wingtip and left canard tip, followed about 30 feet thereafter by the fuselage. The ground scar from fuselage impact was oriented on a 028 degree (magnetic) bearing. The most distant part, the main landing gear assembly, was located about 160 feet from the initial fuselage impact, and about 190 feet

from the initial wingtip/canard impact. All control surfaces were accounted for. Many pieces of foam, fiberglass and canopy plastic littered the area.

The frequency of the communications transceiver was set to 118.30, Johnson County Industrial Air Traffic Control Tower. The VOR navigation receiver was set to 115.90, the Butler VOR, about 36 nautical miles distant, and a course of 120 degrees was set in the omni bearing selector of the course deviation indicator. A LORAN navigation receiver was installed but it's displays were electrically powered and could not be determined. The transponder was set to code 1200 and mode C altitude reporting had been selected.

The throttle quadrant had been detached from the aircraft and was found with the throttle and mixture levers full forward. The control cables had separated from the engine, however, and levers moved easily. The fuel selector and valve was in the main tanks position.

The flight and engine instruments had returned to either zero or their normal power-off indications, with the exception of the turn coordinator. The symbolic airplane on the turn coordinator showed a right turn of approximately full scale. The pilot's altimeter indicated 4,980 feet and a second, stand-by altimeter indicated 1,350 feet. Both altimeters were set to 30.03 inches of barometric pressure. The mechanical clock was found still running.

The battery master and alternator switches were on. The magnetos were selected on in the both position. The landing gear selector switch was badly damaged and it's position at impact could not be determined. The electrically powered nose wheel landing gear was fully retracted, however. The ELT had broken loose and was damaged too badly to operate. It's original position in the aircraft could not be determined. Failure of the ELT to operate did not hinder locating the aircraft. Emergency response personnel had arrived at the scene within minutes after the accident.

MEDICAL AND PATHOLOGICAL INFORMATION

A postmortem examination and toxicology analysis of the pilot failed to produce any evidence of pilot incapacitation prior to the accident. The autopsy was performed by Dr. Bonita J. Peterson, 4550 Warwick, Kansas City, Missouri, 64111.

ADDITIONAL INFORMATION

As the right fuel tank filler cap and a section of the wooden propeller could not be located at the accident site, a search of runway 17, the departure runway, was conducted later that afternoon. Approximately 5,000 feet from the threshold of runway 17, a major portion of the latch to the fuel filler cap was located. Also located were splinters of wood and a large, missing piece of the propeller. The fuel cap itself, however, could not be located.

On Saturday, June 19, 1993, approximately 75 naval reservists from the Naval Air Reserve Center, Olathe, were recruited to perform a walkdown of the grassy areas adjacent to runway

17 to search for the missing fuel filler cap. The missing cap was ultimately located about 90 feet from the west edge of the runway 17, about 5,000 feet from the threshold.

The cap was intact and a small portion of the latch was still attached, captured in place by a roll pin such that no movement was possible. When the large remnant of the latch was fitted to the small, captured piece, it shows the overall position of the latch as perpendicular to the flat surface of the cap, and thereby in the unlatched position. Other than the broken latch, the cap appeared to be in very good condition. There were signs of abrasion across the upper surface of the cap, consistent with impact from the plastic leading edge of the wooden propeller. The propeller remnant recovered from the runway showed signs of abrasion on it's plastic leading edge consistent with such impact.

There is no turn-to-engage locking mechanism on this cap nor was a retention chain installed. The fuel filler cap and adapter ring have been identified as Wicks Aircraft Supply part number FC100-002.

The wreckage was released to a representative of the Greer estate on June 26, 1993.

Pilot Information

Certificate:	Private	**Age:**	61,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Unknown
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 3 Valid Medical--w/ waivers/lim	**Last FAA Medical Exam:**	June 24, 1992
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	1273 hours (Total, all aircraft), 1128 hours (Total, this make and model), 1230 hours (Pilot In Command, all aircraft), 23 hours (Last 90 days, all aircraft), 11 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	EMORY W. GREER, JR.	**Registration:**	N222EG
Model/Series:	VARI-EZE VARI-EZE	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	Yes
Airworthiness Certificate:	Experimental (Special)	**Serial Number:**	914
Landing Gear Type:	Retractable - Tricycle	**Seats:**	2
Date/Type of Last Inspection:	May 20, 1993 Annual	**Certified Max Gross Wt.:**	1150 lbs
Time Since Last Inspection:	10 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	1128 Hrs	**Engine Manufacturer:**	LYCOMING
ELT:	Installed, not activated	**Engine Model/Series:**	O-235-C2A
Registered Owner:	EMORY W. GREER, JR.	**Rated Power:**	115 Horsepower
Operator:	EMORY W. GREER, JR.	**Operating Certificate(s) Held:**	None
Operator Does Business As:		**Operator Designator Code:**	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	IXD ,1087 ft msl	**Distance from Accident Site:**	
Observation Time:	09:30 Local	**Direction from Accident Site:**	
Lowest Cloud Condition:	Scattered / 1300 ft AGL	**Visibility**	8 miles
Lowest Ceiling:	Broken / 12000 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	12 knots / None	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	180°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30 inches Hg	**Temperature/Dew Point:**	22°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:		**Type of Flight Plan Filed:**	VFR
Destination:	JONESBORO (JBR)	**Type of Clearance:**	VFR
Departure Time:	00:00 Local	**Type of Airspace:**	Class D;Class E

Airport Information

Airport:	JOHNSON COUNTY INDUSTRIAL IXD	**Runway Surface Type:**	Concrete
Airport Elevation:	1087 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	0	**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	1 Fatal	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Fatal	**Latitude, Longitude:**	38.829803,-94.889488(est)

Administrative Information

Investigator In Charge (IIC):	CARLSON, RICHARD
Additional Participating Persons:	MARVIN R TREASE; KANSAS CITY , MO WILLIAM R FREEMAN; LENEXA , KS TERRY J YAKE; OVERLAND PARK , KS
Original Publish Date:	October 20, 1994
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=9132