Aviation Investigation Final Report

Location:	NEWCASTLE, Wyoming	**Accident Number:**	DEN99FA148
Date & Time:	August 17, 1999, 17:27 Local	**Registration:**	N1370R
Aircraft:	Grumman American AA-5	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	4 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot was giving sightseeing rides to relatives at a family reunion. On his fifth flight, with three passengers, the airplane impacted three electrical transmission wires which were 214 feet above ground level, and located 5 nautical miles north of the airfield. The airplane came to rest 924 feet south of the transmission wires. Postimpact fire consumed the airplane.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's inadequate visual lookout and inadequate altitude/clearance from the transmission wires.

Findings

Occurrence #1: IN FLIGHT COLLISION WITH OBJECT
Phase of Operation: MANEUVERING

Findings
1. (F) OBJECT - WIRE,TRANSMISSION
2. (C) VISUAL LOOKOUT - INADEQUATE - PILOT IN COMMAND
3. (C) ALTITUDE/CLEARANCE - INADEQUATE - PILOT IN COMMAND

Factual Information

HISTORY OF FLIGHT

On August 17, 1999, at 1727 mountain daylight time, a Grumman American AA-5 Traveler, N1370R, was destroyed following impact with transmission wires near Newcastle, Wyoming. The airline transport pilot and his three passengers were fatally injured. The airplane was being operated by the pilot under Title 14 CFR Part 91. Visual meteorological conditions prevailed for the local flight which originated from Mondell Field, Newcastle, Wyoming, approximately 20 minutes before the accident. No flight plan had been filed.

A family member said that he and the pilot had departed on July 30 for a cross-country flight from Poplar Grove, Illinois, to the west coast. On August 12 they began their return trip arriving at Custer, South Dakota, on August 14. He said that on August 16, the pilot gave him and two other family members a scenic flight around the Black Hills.

According to the Mondell Field FBO manager at Newcastle, the pilot arrived on the morning of August 17. Family members said that the pilot moved the airplane from Custer, South Dakota, to Newcastle, Wyoming, because he was planning to give sighteseeing rides to family members who were at a nearby family reunion. The FBO manager said he observed the pilot give four sightseeing flights to family members, which he estimated were each 30 minutes in length. He further stated that the pilot approached him at approximately 1645, requesting to purchase additional fuel after his fifth flight. The pilot said that he would be back by 1730.

A witness, located approximately 1.5 nm east of the accident site (N43 degrees 58.09 minutes, W104 degrees 13.99 minutes, elevation 4,981 feet), reported seeing the airplane fly low over her house "just above the tree tops, and was headed in a northwest direction. The plane was level and was flying at a good rate of speed." Family members waiting for the flight to return spotted smoke north of the airfield. The FBO manager flew to the smoke source, and found a downed power line and the airplane wreckage nearby.

PERSONNEL INFORMATION

According to a family member, the pilot was trained by the U.S. Navy to be an aviator. He later was hired by United Airlines, and was currently assigned as a first officer in a Boeing 767. On his last FAA medical application, dated May 20, 1999, he reported that he had 5,000 hours of flight experience with 500 hours during the previous 6 months.

FAA records indicate that the pilot received his airline transport certificate on May 11, 1999, and his single engine flight instructors certificate on April 29, 1999.

AIRCRAFT INFORMATION

The airplane was a single engine, propeller-driven, four seat airplane, which was manufactured by Grumman American Aviation Corporation, in 1975. It was powered by a Textron Lycoming O-320-E2G, four cylinder, reciprocating, horizontally opposed, direct drive, air cooled, normally aspirated (carbureted) engine, which had a maximum takeoff rating of 150 horsepower at sea level. At the last annual inspection on March 10, 1999, the documented airframe total time was 3,268 hours. The engine had 670 hours since major overhaul. Pilot flight logbooks and a personal log kept by a passenger from a prior cross-country trip indicated that the airplane had been flown 78 hours since the annual inspection.

FAA records indicate that the pilot registered the airplane on February 8, 1996.

WRECKAGE AND IMPACT INFORMATION

The airplane was found on a hill (N43 degrees 57.74 minutes, W104 degrees 16.17 minutes, elevation 4,700 feet, density altitude 6,954 feet) in a small valley in the Black Hills, from the Mondell Field, Newcastle, Wyoming, approximately 5 nautical miles (nm) on a heading of 015 degrees. The terrain was soil covered rock, with 12 to 18 inch in diameter pine trees. A separated electrical transmission wire (one of 3 parallel wires) was found 924 feet from the airplane, and subsequently forest fires were ignited at both locations. The two wires (still intact) north of the separated wire exhibited electrical arcing damage, white paint transfer, abrasive damage, and separated strands. An airplane parts debris field extended for 300 feet from under the wires towards the burned airplane on a 154 degree heading.

The airplane was found upright with its longitudinal axis on a 190 degree heading. The fuselage was broken near the aft wing root area, and both wings were broken from the fuselage but still attached with their flight control cables. The wings were oriented approximately 145 degrees. The postimpact fire damage consumed the fuselage, cockpit area, and most of the wings (see attached photographs). The front attachments of the vertical stabilizer were separated, and the vertical stabilizer was rotated aft. The upper 14 inches of the vertical stabilizer had separated, and the rudder rotation bar exhibited blackened and pitted metal similar to electrical arcing.

All of the airplane's major components were accounted for at the accident site (to include the debris field). The debris field contained the windscreen canopy bow with magnetic compass, the empennage dorsal stabilizer, the upper 14 inches of the vertical stabilizer with red navigation light, the pitot static tube, the rudder, the pilot's sun glasses, and numerous Plexiglas and paint shards. All the flight controls were accounted for, but postimpact thermal damage prevented continuity checks.

The engine was impact and fire damaged. The propeller, spinner, starting gear, and engine crankshaft flange had separated from the crankshaft and were located approximately 45 feet away from the fuselage, and approximately 10 feet from the first elongated slash in the ground

(first impact point). All of the accessories which were mounted at the rear of the engine were destroyed by fire. The crankshaft and valve train could not be rotated, due to impact and thermal damage. All flight controls, engine controls, and cockpit instrumentation were destroyed by fire. Both propeller blades displayed leading edge gouging. One blade exhibited cordwise striations across the cambered surface, abraded paint removal, and a mid-point 80 degree bend with "S" twisting. The other blade had a blackened and pitted area which suggested electrical arching.

No preimpact engine or airframe anomalies, which might have affected the airplane's performance, were identified.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy was performed on the pilot at the Clinical Laboratory of the Black Hills, Rapid City, South Dakota, on August 19, 1999.

Toxicology tests were performed on the pilot by the FAA's Civil Aeromedical Institute (CAMI) in Oklahoma City, Oklahoma. According to CAMI's report (#9900220001), the pilot's blood was tested for carbon monoxide and cyanide with negative results, and no ethanol was detected in his urine. The drug codeine, and its metabolites morphine and hydrocodone, were detected in the urine. Codeine is found in cough suppressants and prescription painkillers. Acetaminophen was also found in the pilot's urine, and it is a common pain reliever/fever reducer, also know by the trade name Tylenol. None of the substances detected were found in his blood.

TESTS AND RESEARCH

The 3 parallel 67,000 volt transmission wires (N43 degrees 57.89 minutes, W104 degrees 16.22 minutes, elevation 4,624 feet) were .49 inches in diameter, 20 feet horizontally apart, and were aligned 085-265 degrees. From the beginning point of the debris field, they were 214 feet above the valley floor, and stretched 1,970 feet between supporting pole-towers. Each wire weighed .563 pounds per foot, or 1,109 pounds. Title 14 Code of Federal Regulations Part 77.23, states that obstructions must be marked if they are higher than 200 feet above the ground, within 3 nm of an airport which has a runway longer than 3,200 feet. These wires were located in a sparsely populated area approximately 5 nm from the airfield.

ADDITIONAL DATA

The airplane, including all components and logbooks, was released to a representative of the owner's insurance company on September 13, 1999.

Pilot Information

Certificate:	Airline transport; Flight instructor	**Age:**	35,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	Airplane single-engine	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 Valid Medical--no waivers/lim.	**Last FAA Medical Exam:**	May 15, 1999
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	5000 hours (Total, all aircraft), 225 hours (Last 90 days, all aircraft), 3 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Grumman American	**Registration:**	N1370R
Model/Series:	AA-5 AA-5	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	AA5-0770
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	March 10, 1999 Annual	**Certified Max Gross Wt.:**	2200 lbs
Time Since Last Inspection:	78 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	3345 Hrs	**Engine Manufacturer:**	Lycoming
ELT:	Installed, not activated	**Engine Model/Series:**	O-320-E2G
Registered Owner:	KYLE E. ENGEL	**Rated Power:**	150 Horsepower
Operator:		**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:	GCC ,4363 ft msl	**Distance from Accident Site:**	60 Nautical Miles
Observation Time:	17:55 Local	**Direction from Accident Site:**	310°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	8 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	350°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30 inches Hg	**Temperature/Dew Point:**	28°C / 8°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	(ECS)	**Type of Flight Plan Filed:**	None
Destination:		**Type of Clearance:**	None
Departure Time:	17:10 Local	**Type of Airspace:**	Class G

Airport Information

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

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	3 Fatal	**Aircraft Fire:**	On-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	4 Fatal	**Latitude, Longitude:**	43.839275,-104.209556(est)

Administrative Information

Investigator In Charge (IIC):	Struhsaker, James
Additional Participating Persons:	OWEN R JONES; CASPER , WY MARK W PLATT; WILLIAMSPORT , PA
Original Publish Date:	July 12, 2000
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=47097