Aviation Investigation Final Report

Location:	Paradise, California	**Accident Number:**	WPR13FA370
Date & Time:	August 13, 2013, 11:30 Local	**Registration:**	N9607S
Aircraft:	Champion 7GCAA	**Aircraft Damage:**	Destroyed
Defining Event:	Loss of control in flight	**Injuries:**	2 Fatal
Flight Conducted Under:	Part 91: General aviation - Aerial observation		

Analysis

The pilot and passenger were flying pipeline patrol to visually inspect conditions along a gas transmission line. The wreckage was found near the bottom of a canyon adjacent to the pipeline being patrolled. A camera mounted on the airplane's left forward wing strut captured video of the accident flight. The video of the flight showed that, moments before the accident, the airplane was flying above slowly rising terrain while paralleling the canyon on its right side. About 300 ft above ground level, the airplane appeared to encounter an updraft from the canyon, and, shortly after, it entered a right roll. The airplane continued rolling right and made three rotations. During the first rotation, the airplane's nose pitched down, and, during the second and third rotations, the airplane's nose maintained a constant descent angle before colliding with terrain. The video revealed that all of the flight controls were intact and that the engine was operating with power at the time of the accident. The video did not reveal any evidence of an airplane malfunction. Postaccident examination of the airframe and engine revealed no evidence of mechanical malfunctions or failures that would have precluded normal operation.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

The pilot's failure to maintain airplane control during low-altitude maneuvering after encountering an updraft.

Findings

Personnel issues	Aircraft control - Pilot
Aircraft	Altitude - Not attained/maintained
Aircraft	Lateral/bank control - Not attained/maintained
Environmental issues	Updraft - Effect on equipment
Environmental issues	Updraft - Contributed to outcome

Factual Information

History of Flight

Maneuvering-low-alt flying	Loss of control in flight (Defining event)
Uncontrolled descent	Collision with terr/obj (non-CFIT)

HISTORY OF FLIGHT

On August 13, 2013 about 1130 Pacific daylight time, a Champion 7GCAA, N9607S, collided with the ground while maneuvering near Paradise, California. The airplane was registered to the pilot and operated by AA Aerial Surveillance (AAAS), LLC, under the provisions of Title 14 Code of Federal Regulations Part 91 as an aerial observation flight. The commercial pilot and Aerial Patrol Observer (APO) were fatally injured, and the airplane was destroyed. Visual meteorological conditions prevailed, and a flight plan was not filed. The cross-country flight originated from the Nut Tree Airport (VCB), Vacaville, California about 0850 with a destination of Chico Municipal Airport (CIC), Chico, California.

According to local law enforcement personnel, a witness was driving on California Highway 99 northbound when he saw an airplane flying near Hamlin Canyon to the east of his position. After turning onto Neal Road northeastbound, he looked to the east to see the airplane just above the tree line. The airplane was flying relatively northbound when it pitched up, banked right and then nosed down, spiraling to the ground. The witness further stated that it made 1 and 1/2 "spirals" before he lost sight of it behind trees on top of the ridgeline that bounds the north side of Hamlin Canyon.

According to a representative from Pacific Gas & Electric (PG&E), the pilot who was a co-owner of AAAS, and the APO, who was employed by Frontline Energy Services Inc. dba Frontline Energy Services (FES), were flying pipeline patrol to visually inspect conditions along a gas transmission line that serves the gas distribution system in the town of Paradise. PG&E contracted separately with AAAS to provide and fly the patrol planes, and FES to observe and document the patrols. The purpose of aerial observation flights is to inspect the pipeline right-of-way and adjacent areas for threats to the safety and integrity of gas facilities. The specific underground pipeline being patrolled at the time of the accident extended northeast along the top of a flat ridge surrounded on either side by rugged canyons. A video recording device attached to the exterior of the airplane records a view of the terrain being patrolled for later examination by a different APO.

PERSONNEL INFORMATION

Pilot (Commercial Pilot, Front Cockpit)

The pilot, age 54, held a commercial pilot certificate with ratings for airplane single-engine land, multiengine land, and instrument airplane. He also held a flight engineer certificate; as well as a mechanic's certificate with airframe and powerplant ratings.

The pilot held an FAA second-class medical certificate that was issued on March 11, 2013 with limitations that the pilot must have available glasses for near vision. The pilot's application for that certificate reported that he had accrued 3,750 total hours and 250 in the last 6 months.

According to PG&E records, the pilot logged 74.9 hours of familiarization flight time covering various pipelines in the system flown by another experienced patrol pilot between the period of July 24, 2012 and November 27, 2012. The pilot then logged 413.6 hours of flight time as a patrol pilot accompanied with an APO from October 26, 2012 to August 12, 2013, with 269 hours of flight time logged after his FAA medical on March 11, 2013. This flight time was in both the accident airplane, as well as other aircraft. About 141.1 hours of pipeline patrol was recorded in the accident airplane in the 6 months prior to the accident.

Aerial Patrol Observer (Non-pilot rated, Rear Cockpit)

The APO directed the patrol mission, assisted the pilot as a crew member during flight operations, collected data concerning any observed threats, and communicated with the PG&E dispatchers. The APO had 70 hours of training and familiarization flights from March 5, 2013 to April 18, 2013 prior to flying 197 hours as a fully qualified patroller from May 6, 2013 until the date of the accident. In addition, the APO documented performing video review totaling 103 hours.

AIRCRAFT INFORMATION

The two-seat, high-wing airplane, serial number (S/N) 52, was manufactured in 1966, and was powered by a Lycoming O-320-A2B engine, rated at 160 horsepower. The airplane was also equipped with a Sensenich fixed-pitch propeller. The airplane was maintained under the manufacturer's approved inspection program. The airplane logbooks were not obtained during the investigation.

A Contour+2 video recorder was mounted on the left forward wing strut at about mid span position pointed about 30° below the horizon when in level cruise flight. According to PG&E, the video is used for postflight review and quality assurance. The video is collected at 30 frames per second and can store 32gigabytes of data on a microSD card located in the camera. The camera is also able to capture GPS and audio information.

METEOROLOGICAL INFORMATION

A review of recorded data from the CIC airport automated weather observation station, located about 12 miles northwest of the accident site, revealed that at 1059, conditions were calm wind, visibility 25 statute miles, clear sky, temperature 26° C, dew point 9° C, and an altimeter setting of 29.97 inches of Mercury. The remarks stated smoke in the area. At 1150, conditions were wind 200° at 4 knots, visibility 25 statute miles, clear sky, temperature 29° C, dew point 10° C, and an altimeter setting of 29.96 inches of Mercury. The remarks indicated the presents of smoke in all quadrants.

A review of recorded data from the Oroville Municipal Airport (OVE), Oroville, California automated weather observation station, located about 14 miles southeast of the accident site, revealed that at 1053 conditions were variable wind at 4 knots, visibility 10 statute miles, clear sky, temperature 27° Celsius, dew point 14° Celsius, and an altimeter setting of 29.97 inches of Mercury.

COMMUNICATIONS

TracPlus Nano GPS Transponder

The airplane was equipped with TracPlus Nano (TracPlus), a transponder that sends flight information derived from GPS data about every two minutes to an Iridium satellite which is then relayed to a server maintained by Tracplus that is accessed via a secured website by both PG&E and FES. The data consisted of exact time and date of transmission, altitude from mean sea level (msl), and latitude and longitude coordinates. Aircraft heading and ground speed is derived from the recorded parameters. The purpose of collecting this data is to monitor the patrol progress, improve operational situational awareness, and evaluate patrol process effectiveness.

The TracPlus information was used during the investigation to create a map showing the route of the airplane's flight. A map of the accident flight confirmed that the accident airplane departed from VCB at 0850, showed a normal flight path above the scheduled patrol route up to about two miles southwest of the accident site where the last position report at 1129 was automatically sent. Total duration of the patrol flight was about 2 hours and 41 minutes. The last two position reports recorded at 1127 and 1129 indicated an altitude of 689 and 761 feet msl, at a ground speed of 75 and 55 knots, respectively. The terrain in the area of the last two position reports are about 200 feet and 400 feet msl, respectively. This map can be found in the public docket for this report.

WRECKAGE AND IMPACT INFORMATION

The rocky, brush-covered terrain surrounding the wreckage is on an east-facing 30° slope of a canyon. Postimpact fire was found throughout the debris path and surrounding terrain. About 21 acres of land were burned.

The debris path was about 50 feet in length and about 20 feet wide. The first identified point of contact (FIPC) was a rocky outcropping about 10 feet uphill from the main wreckage. The direction of the wreckage debris path was oriented on a heading of about 120° magnetic from the FIPC to the main wreckage. The main wreckage was found inverted, with the nose section on a heading of about 300 degrees magnetic.

The main wreckage was mostly consumed by postimpact fire. The aft fuselage and tail section structure was intact and partially separated near the cabin area. The tail section was lying on top of the fuselage and right wing. Both wings had extensive thermal damage. The fuel tanks were partially consumed by fire. The forward and aft wood wing spars had extensive fire damage. Flight control cable continuity was obtained from all flight controls to the cabin area. The forward control stick separated from the control linkage assembly. The forward control linkage assembly had thermal deformation. The aileron lever arms on the control stick torque tube assembly separated with overload signatures. The aileron cables remained attached to the separated lever arms. The forward and aft seat structures had impact damage and remained partially attached to the fuselage. The forward seatbelt buckle assembly including the lap belt attachment and both shoulder belt attachments were secured in the buckle. The aft seatbelt buckle was found loose from the lap belt attachment and both shoulder belt attachments. The majority of the seatbelt webbing was consumed by fire.

The engine was found inverted with thermal damage to the oil sump and accessory areas. The propeller assembly remained attached to the crankshaft propeller flange. One of the propeller blades had missing material and thermal deformation. Aluminum drippings were found directly below the damaged blade

and extended in the outboard direction about 14 inches. The other blade had thermal discoloration and was undamaged. The no. 2 and 4 cylinder assemblies had thermal deformation. The no. 4 exhaust stack separated from the cylinder attachment flange.

A video recorder was found between the FIPC and the main wreckage. The video recorder had impact and thermal damage and was retained for further examination.

POST RECOVERY WRECKAGE EXAMINATION

Examination of the recovered airframe and flight control system components revealed no evidence of preimpact mechanical malfunction.

The forward seat had thermal damage. The rear seat revealed impact damage to its structure and deformation of the metal lower seat webbing.

Examination of the engine revealed impact damage to the exhaust assembly and thermal damage to several engine components. The oil sump had impact and thermal damage. The crankcase internal surfaces were examined with the use of a lighted boroscope through holes drilled in the top of the crankcase. No anomalies were noted. The induction assembly was mostly consumed by postimpact fire, and only induction elbows remained attached to the cylinders. The carburetor was mostly consumed by postimpact fire. The throttle and mixture controls remained securely attached at their respective control arms. Examination of the recovered engine and system components revealed no evidence of preimpact mechanical malfunctions or failures that would have precluded normal operation.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy on the pilot and the APO was completed under the jurisdiction of the Butte County Sherriff's Office in Oroville, California. According to the reports, the causes of death were reported as multiple traumas due to an airplane accident.

The FAA Bioaeronautical Sciences Research Laboratory Forensic Toxicology Research Team, Oklahoma City, Oklahoma, performed toxicological testing of specimens of the pilot. Analysis of the specimens contained no findings for volatiles, and tested drugs. For specific test parameters and results refer to the toxicology report in the public docket for this report.

TESTS AND RESEARCH

The left forward wing strut-mounted Contour 2+ video recorder was sent to the NTSB Vehicle Recorders Division for examination.

The examination revealed that the video recorder had significant structural damage, but the internal 32GB microSD card was not physically damaged. The card was removed and the accident flight was identified. The video of the accident flight was recovered without audio or GPS information.

The video of the accident flight was examined and revealed no anomalies until the airplane's upset, that began about 300 feet above the top edge of a canyon wall. Just prior to the upset, the airplane's nose pitched up and down slightly, leveled out for a few seconds before rolling to the right. The airplane continued to the right making three 360-degree rotations before colliding with terrain about 200 feet

below the canyon rim. During the rotations, the nose of the airplane pitched down, and then the nose of the airplane maintained a constant angle of descent during the second and third 360-degree rotations to the FIPC. The propeller was visible and was constant in speed throughout the video. The video also revealed the shadow of the airplane several times throughout the flight and upset. For further information see the Video Recorder report in the public docket.

A video study was performed to estimate the motion of the airplane during the flight. The airplane was determined to have ground speed of about 61 mph (10 mph above the specified stall speed of 51 mph) just prior to the airplane's upset. Pitch angle increased by 8 degrees over a two-second period just prior the airplane's upset. The roll angle slowly increased from a slow to fast rate. There was no information in the video on the cause of the fast increase of roll angle. For further information see the Video Study report in the public docket.

Pilot Information

Certificate:	Commercial; Flight engineer	**Age:**	54
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Front
Other Aircraft Rating(s):	None	**Restraint Used:**	4-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 With waivers/limitations	**Last FAA Medical Exam:**	March 12, 2013
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	October 1, 2012
Flight Time:	3750 hours (Total, all aircraft)		

Passenger Information

Certificate:		**Age:**	26
Airplane Rating(s):		**Seat Occupied:**	Rear
Other Aircraft Rating(s):		**Restraint Used:**	None
Instrument Rating(s):		**Second Pilot Present:**	No
Instructor Rating(s):		**Toxicology Performed:**	No
Medical Certification:		**Last FAA Medical Exam:**	
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:			

Aircraft and Owner/Operator Information

Aircraft Make:	Champion	**Registration:**	N9607S
Model/Series:	7GCAA	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal; Restricted (Special)	**Serial Number:**	52
Landing Gear Type:	Tailwheel	**Seats:**	2
Date/Type of Last Inspection:	August 12, 2013 100 hour	**Certified Max Gross Wt.:**	
Time Since Last Inspection:	2 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:		**Engine Manufacturer:**	LYCOMING
ELT:	Installed, not activated	**Engine Model/Series:**	O-320 SERIES
Registered Owner:	Frederick D. Lewis	**Rated Power:**	160 Horsepower
Operator:	AA Aerial Surveillance, LLC.	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KCIC,240 ft msl	**Distance from Accident Site:**	12 Nautical Miles
Observation Time:	17:59 Local	**Direction from Accident Site:**	300°
Lowest Cloud Condition:	Clear	**Visibility**	25 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	/	**Turbulence Type Forecast/Actual:**	/ None
Wind Direction:		**Turbulence Severity Forecast/Actual:**	/ N/A
Altimeter Setting:	29.96 inches Hg	**Temperature/Dew Point:**	26°C / 9°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	NutTree Airport, CA (KVCB)	**Type of Flight Plan Filed:**	None
Destination:	Chico Municipal, CA (KCIC)	**Type of Clearance:**	None
Departure Time:	08:50 Local	**Type of Airspace:**	Class G

Airport Information

Airport:	CHICO MUNI CIC	**Runway Surface Type:**	
Airport Elevation:	240 ft msl	**Runway Surface Condition:**	Unknown
Runway Used:		**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	1 Fatal	**Aircraft Fire:**	On-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Fatal	**Latitude, Longitude:**	39.70111,-121.673332

Administrative Information

Investigator In Charge (IIC):	Swick, Andrew
Additional Participating Persons:	Dan W Addon; FAA-FSDO; Sacramento, CA Ken McClure; Pacific Gas and Electric; Vacaville, CA Mark Platt; Lycoming Engines; Los Angeles, CA
Original Publish Date:	March 10, 2015
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=87775