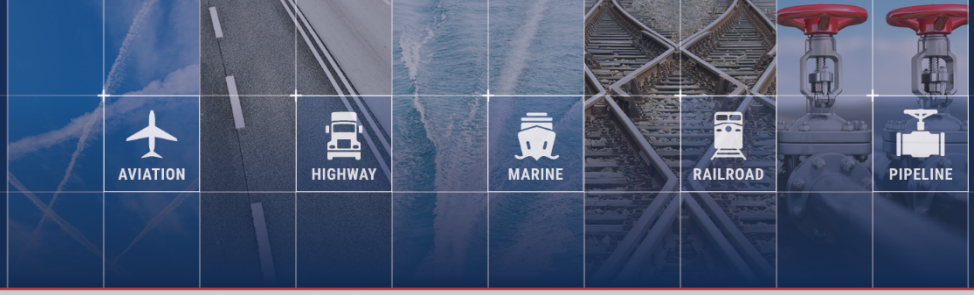

Aviation Investigation Factual Report

Location:	Baker, California	**Accident Number:**	LAX05FA311
Date & Time:	September 20, 2005, 16:00 Local	**Registration:**	N957SH
Aircraft:	Robinson Helicopter R22 Beta	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Positioning		

Factual Information

HISTORY OF FLIGHT

On September 20, 2005, about 1600 Pacific daylight time, a Robinson R22 Beta helicopter, N957SH, collided with mountainous terrain 30 miles northeast of Baker, California, while on a cross-country flight. Silver State Helicopters operated the helicopter under the provisions of 14 CFR Part 91. The commercial pilot was fatally injured and the helicopter was destroyed. Visual meteorological conditions generally prevailed along the route of flight, and no flight plan had been filed. The positioning cross-country flight originated at Zamperini Field, Torrance, California, at 1425, with an intended destination of North Las Vegas Airport, Nevada.

Silver State Helicopters was taking delivery of 12 helicopters and sent a number of pilots to the Robinson Helicopter Company, Torrance, on September 20th to take possession of these new ships and fly them to their destinations. The weather at Torrance when they arrived was below VFR (visual flight rules) minimums. The pilots delayed their departure until after lunch when the weather began to clear up. One of the people who had lunch with the accident pilot stated that the accident pilot was anxious to get going, saying he had to be home in Las Vegas by 1600. The accident pilot also was observed receiving a number of calls on his mobile phone in which he was overheard saying he would be home by 1600.

The accident pilot was the fourth helicopter in a loose trail of four helicopters that were separated about 15 minutes apart, all traveling to the east. The helicopters started taking off around 1400, and it is estimated that the accident pilot took off at 1425. The four helicopters were in radio communications with each other on a company frequency. The planned route of flight was Torrance, Compton, Brackett, north of Ontario through the Cajon Pass, Daggett, Baker, and Jean to North Las Vegas, their destination. This route of flight is approximately 270 miles, and would take about 2.6 to 3.0 hours to complete. Because of the distances between the helicopters, the lead helicopter could not communicate directly with the farthest aft trailing helicopter. The helicopter ahead of the accident helicopter crossed over Daggett at 1530, and 5 minutes later heard the accident pilot talking to a California Highway Patrol (CHP) aircraft as the two aircraft approached Daggett to coordinate separation between each other. During the radio communications between the CHP pilot and the accident pilot, the accident pilot said that he was transitioning to the northeast and following the power lines. The CHP pilot and two of the helicopter pilots ahead of the accident pilot stated that they observed precipitation and lightning to the northeast of their route of flight around this time. About 1545, the lead helicopter pilot made a radio call that there was a storm system north of the Silver MOA (military operations area) and recommended staying south of it. The Silver MOA is a 35-mile by 35-mile triangular shaped section of airspace that is centered over Baker, California. The helicopter pilot that was about 15 minutes ahead of the accident pilot tried to contact the accident pilot over the radio at this time but was not successful.

The three helicopters continued to their destinations. The next morning the Silver State Helicopter office in Las Vegas determined that the accident pilot had not arrived at his intended destination and initiated a search. The Civil Air Patrol located the helicopter wreckage at 1100 on September 21, 2005.

PERSONNEL INFORMATION

A review of Federal Aviation Administration (FAA) airman records revealed the pilot held commercial and flight instructor certificates with ratings for rotorcraft-helicopter, instrument-helicopter, flight instructor-helicopter, ground instructor-instrument, and private pilot privileges for airplane single engine land. The most recent rating was his helicopter instrument rating issued on June 10, 2005. The pilot held a second-class medical issued in February 2005, with the limitation that the pilot must wear corrective lenses.

An examination of the pilot's logbook indicated that he had accumulated an estimated total flight time of 876.7 hours, with 840.1 hours of that in helicopters. There were no flights logged for the 30 days prior to the accident flight.

AIRCRAFT INFORMATION

The helicopter was a Robinson R22 Beta, two-place helicopter, recently manufactured, and had a total engine/airframe flight time of 4.0 hours. It had a fuel capacity of 30 gallons, which corresponds to about 3 hours of flight time. Cruise airspeed for the R22 is about 90 knots.

The helicopter was equipped with a Garmin GNC 250XL GPS (global positioning system) navigation receiver and communications radio. The GNC 250XL has a 'direct to' function, which allows the pilot to enter a waypoint, and the GNC 250XL calculates a direct course to the waypoint (destination) and displays that information to the pilot.

METEOROLGICAL INFORMATION

A National Transportation Safety Board meteorological specialist examined the weather conditions at the time and location of the accident. As a result of the remote location of the accident site, weather reporting facilities were not available in the local vicinity of the accident location. Therefore, weather data was gathered from the National Weather Service weather depiction chart for 2200Z (1500 PDT), September 20, 2005, WSR-88D Doppler Weather Radar, ESX Base Reflectivity images, and GOES-10 visible an infrared images for the time period between 2200Z and 2300Z, September 20, 2005.

The weather depiction chart indicates an area of IFR (instrument flight rules) with ceilings less than 1,000 feet in the vicinity of the accident.

Doppler radar image capture at 2253Z (1553 PDT) displays radar echo intensities between the

20- and 30-decibel range at the accident location. The echo intensity depicted corresponded to a light to moderate precipitation level.

ESX Base Reflectivity image for 2259Z (1559 PDT) displays radar echo intensities between 15 and 25 decibels at the accident location. The echo intensities depicted correspond to a very light precipitation level.

GOES-10 satellite imagery at 2245Z (1545 PDT) displays images of cloud coverage over the accident location.

The entire meteorological factual report is contained in the official docket of this investigation.

SURVIVAL ASPECTS

The Air Force Rescue and Coordination Center (AFRCC) detected an ELT (emergency locator transmitter) signal at 0115Z, September 21, 2005 (1815 PDT), by the SARSAT (Search And Rescue Satellite Aided Tracking system). The signal was classified as a 'first alert' with the origin site of the signal in Nevada. A second satellite pass did not acquire the ELT signal. At 0213Z (1913 PDT), the AFRCC received a second 'first alert', and a second satellite pass merged the signals at 0528Z (2228 PDT). At 0842Z (0142 PDT), the Civil Air Patrol (CAP) was assigned the search mission. The local CAP mission commander reported the location of the missing helicopter at 1800Z (1100 PDT).

The accident pilot did call the North Las Vegas Silver State facilities Chief CFI around 1300 on September 20 to say he was delayed. The accident pilot did not call the Chief CFI to inform him of his departure. There was no record of the cross-country flight being tracked by the North Las Vegas Silver State dispatch desk.

There is no record of a FAA flight plan being filed or activated for N957SH on September 20, 2005.

WRECKAGE AND IMPACT INFORMATION

The wreckage was located on the west face of a 3,900-foot ridge line in the California-Nevada boarder desert region. The terrain consisted of a 50-degree slope of barren volcanic rock with boulder and overhang outcroppings. The wreckage coordinates were 35 degrees 38.952 minutes north and 115 degrees 49.777 minutes west, at an elevation of 3,373 feet mean sea level (msl). The wreckage was aligned along a bearing of 282 degrees magnetic. A dry streambed on the canyon floor below the wreckage ran in a west-northwest direction then turned west-southwest before exiting on to the desert floor. The canyon ran in a northwest-southeast direction and ended in a boxed in area with high terrain and slopes surrounding the only entry or egress route on the southeast end. The wreckage lies along a straight line between Daggett and North Las Vegas Airport.

The helicopter rested collapsed on its left side and the airframe exhibited inward crushing of the right underside of the fuselage. All major helicopter components were present with the airframe except for the skid tubes and frame, which were downslope directly below the main wreckage about 20 yards, and one tail rotor blade, which was located laterally behind the wreckage about 35 yards. One main rotor blade was attached to the rotor hub and was curled up and behind the tail boom. The other rotor blade had separated from the hub and was found next to the wreckage. The hub fracture surface was matte gray and homogeneous in color and texture. Green position light glass and fragments of the right skid tube were located in a recessed area of the rock face 3 or 4 feet directly below the main wreckage. Fiberglass shards and gray paint flakes were imbedded in to a rock boulder next to the main wreckage in line with a deformed area of the engine cooling fan shroud. The left side of the cockpit was collapsed leaving no occupiable space in the area of the left seat. The right seat area was deformed and the instrument panel was intact. The collective lever was observed to be close to full upward deflection and the left and right cyclic grips were detached revealing exposed electrical wiring.

The engine exhaust manifold exhibited ductile deformation and the carburetor bowl was detached from the carburetor throat. The bowl was partially covered with a gasket; the gasket exhibited a black burned area and discolorations consistent with a high temperature thermal event. The gascollator was undisturbed. Two double drive belts were located in the engine compartment and each exhibited a single crosswise separation of the belt.

The left landing skid and the entire skid frame was located below the main wreckage. The left skid and the cross tubes appeared undamaged. The right skid was fragmented and the right skid attachment location on the cross tubes had upward bending signatures.

MEDICAL AND PATHOLICAL INFORMATION

The San Bernardino County Sheriff-Coroner completed the autopsy on September 26, 2005. The FAA Bioaeronautical Sciences Research Laboratory, Oklahoma City, Oklahoma, performed toxicological analysis from specimens obtained during the autopsy. The results of the analysis were negative for carbon monoxide, cyanide, volatiles, and tested drugs.

TESTS AND RESEARCH

On October 27, 2005, the wreckage was examined at Aircraft Recovery Services, Pearblossom, California, by safety investigators from the Robinson Helicopter Company and Textron-Lycoming under supervision of the Safety Board investigator-in-charge (IIC).

The cockpit exhibited deformation and upward crushing behind and below the right seat. The windscreen was shattered and the windscreen bow was collapsed. The collective was in about a 25-degree up deflection. Examination of the cockpit instruments revealed that the carburetor heat was locked in the "off" configuration, the magneto switch was in "both", the master switch was "on", navigation and strobe lights were "on", all the circuit breakers were "in", and the Hobbs meter read 6.4. Continuity of the control system was established from the

cockpit to the main rotor swash plate and tail rotor. The freewheel unit rotated freely in the freewheel direction and locked in the power direction.

The tail boom was deflected upward about 20 degrees from the base, collapsed at the mid boom rivet line, and finally the tail rotor section of the tail boom was deformed upward about 80 degrees. One of the tail rotor blades was separated 2 inches outboard from the hub.

With the exception of the outboard 20 inches of each blade, the entire length of both main rotor blades were accounted for. The blue blade was attached to the rotor head and deformed around the fuselage. The blade tip had a ruptured appearance similar to a tree branch with indentations along the blades leading edge. The red blade was separated at the rotor hub/attachment fitting and 10 feet of the blade spar was present. The blade skin and trailing edge structure was separated from the blade spar along its length. The pitch link was observed unscrewed from both ends and both ends of the threaded eyebolt shafts were bent. Engine and transmission drive train continuity was established and the transmission rotated freely.

The left-hand skid tube was straight and had scratches oriented in a 30-degree aft to forward direction on the underside. The rear skid cross tube was displaced about 20 degrees forward and the forward skid cross tube was displaced about 35 degrees forward. The right-hand skid was separated at the aft strut attachment location with an upward bend of the tube material. The skid was separated into four sections with the forward toe skid section separated at the forward strut fitting.

The engine was a Lycoming O-360-J2A, serial number L40146-36A, and was examined while still attached to the airframe. The cooling fan shroud exhibited localized crushing at the 8 o'clock position and ductile bending of the right side exhaust manifold. The valve covers were removed and the engine crankshaft was rotated by hand. All the valves exhibited normal lift action in sequence and firing order. The Teledyne-Continental magnetos produced sparks on all posts and the timing was measured as set at 25 degrees before top dead center. The Autolite UREM38E sparkplug electrodes were gray in color and exhibited no mechanical damage. The carburetor bowl was observed as having been sheared from the carburetor throat/throttle valve.

ORGANIZATIONAL AND MANAGEMENT INFORMATION

Silver State Helicopters utilizes two methods to track cross-country flights (referred to as 'flight-following'). The pilot is responsible to contact the destination office and give departure and arrival details, and the destination office tracks the flight. This method is what is normally used when flying cross-country between two Silver State facilities and is not documented in the 'Silver State Helicopter Company Training Guidelines and Procedures' document version dated May 18, 2005. The method of flight-following that is annotated in the procedures document states 'All cross-country flights, dual or solo will have an official flight plan filed with the appropriate Flight Service Station (FSS).'

ADDITONAL INFORMATION

Radar Data

The FAA could not identify any radar data that could be associated with the accident helicopter in or around the vicinity and time of the accident.

Robinson Helicopter Company Completion Notice

A notice that authorized the accident pilot to accept the helicopter for the purchasing company and fly it to its destination was examined. The notice was dated August 8, 2005, and includes a section where the pilot writes in the intended route of flight and signs the form as the ferry pilot. The accident pilot's intended route of flight, as documented on this notice was; Torrance, to El Monte, to the Cajon Pass, to Daggett, then to North Las Vegas. The pilot also indicates that he had flown this route before.

GPS Navigation

A GPS (Global Positioning System) receiver has the ability to guide a person directly from their current position to another specified terrestrial position using signals generated from satellites orbiting the earth. The helicopter wreckage was located along a straight-line course between Daggett and North Las Vegas. The distance between Daggett and North Las Vegas is 127 miles, which reduces the distance traveled by 30 miles in comparison to the route along Daggett, Baker, Jean, to North Las Vegas, thus reducing the flight time by about 17 minutes if flying at 90 knots.

Wreckage Release

The Safety Board IIC released the wreckage on December 8, 2005. No items were retained.

Pilot Information

Certificate:	Commercial; Flight instructor	**Age:**	35,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	
Instrument Rating(s):	Helicopter	**Second Pilot Present:**	No
Instructor Rating(s):	Helicopter	**Toxicology Performed:**	Yes
Medical Certification:	Class 2	**Last FAA Medical Exam:**	February 1, 2005
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	December 1, 2004
Flight Time:	877 hours (Total, all aircraft), 840 hours (Total, this make and model), 763 hours (Pilot In Command, all aircraft), 11 hours (Last 90 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Robinson Helicopter	**Registration:**	N957SH
Model/Series:	R22 Beta	**Aircraft Category:**	Helicopter
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	3925
Landing Gear Type:	Skid	**Seats:**	2
Date/Type of Last Inspection:	September 1, 2005 Annual	**Certified Max Gross Wt.:**	1370 lbs
Time Since Last Inspection:	0 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	4 Hrs as of last inspection	**Engine Manufacturer:**	Lycoming
ELT:	Installed, activated, aided in locating accident	**Engine Model/Series:**	O-360-J2A
Registered Owner:	Silver State Helicopters	**Rated Power:**	131 Horsepower
Operator:		**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument (IMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KHND,2492 ft msl	**Distance from Accident Site:**	35 Nautical Miles
Observation Time:	15:56 Local	**Direction from Accident Site:**	20°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	6 knots / None	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	340°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.1 inches Hg	**Temperature/Dew Point:**	24°C / 14°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Torrance, CA (KTOA)	**Type of Flight Plan Filed:**	None
Destination:	North Las Vegas, CA (KVGT)	**Type of Clearance:**	None
Departure Time:	13:30 Local	**Type of Airspace:**	

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal	**Latitude, Longitude:**	35.649444,-115.829719

Administrative Information

Investigator In Charge (IIC):	McKenny, Van
Additional Participating Persons:	Jack Halbrook; Federal Aviation Administration; Las Vegas, NV Mark Platt; Textron Lycoming ; Van Nuys, CA Thom Webster; Robinson Helicopter Company; Torrance, CA
Report Date:	November 28, 2006
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=62521