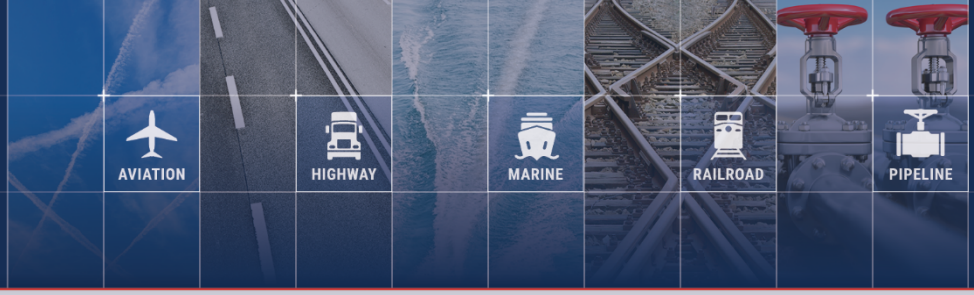

Aviation Investigation Final Report

Location:	IRWINDALE, California	**Accident Number:**	LAX98FA149
Date & Time:	May 1, 1998, 14:02 Local	**Registration:**	N8365D
Aircraft:	Robinson R22	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	1 Fatal, 1 Serious
Flight Conducted Under:	Part 91: General aviation - Instructional		

Analysis

The 10-hour student pilot reported that they had performed several autorotations and normal approaches to sites chosen by the instructor. He was flying the helicopter and the instructor was following on the controls. They were performing a normal landing approach when both he and the flight instructor were startled to see electrical power transmission lines in front of them. The instructor took control of the helicopter and he recalled flying under one group of power lines that he viewed high on the windshield. The instructor then made a pull-up and the rotor impacted a second group of wires and the helicopter fell approximately 60 feet to the ground landing on its left side. The student reported there were no mechanical problems with the aircraft prior to impacting the wires. The operator reported that the instructor flew in this practice area almost daily and was well aware of the presence of the power lines. The student was Japan and spoke limited English.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The failure of the pilot to observe in a timely manner and maintain clearance from electrical power transmission wires and her improper maneuver to avoid the obstruction.

Findings

Occurrence #1: IN FLIGHT COLLISION WITH OBJECT
Phase of Operation: APPROACH - VFR PATTERN - FINAL APPROACH

Findings
1. OBJECT - WIRE,TRANSMISSION
2. (C) VISUAL LOOKOUT - INADEQUATE - PILOT IN COMMAND(CFI)
3. (C) CLEARANCE - NOT MAINTAINED - PILOT IN COMMAND(CFI)
4. (C) MANEUVER TO AVOID OBSTRUCTIONS - IMPROPER - PILOT IN COMMAND(CFI)

Occurrence #2: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

Factual Information

HISTORY OF FLIGHT

On May 1, 1998, at 1402 hours Pacific daylight time, a Robinson R22, N8365D, was destroyed when it impacted power transmission lines approximately 65 feet above ground level and then impacted the ground at Irwindale, California. The commercial licensed flight instructor was fatally injured and the student pilot was seriously injured. Visual meteorological conditions existed for the local area instructional flight which departed from Bracket Field, La Verne, California, at 1315.

The 10-hour student pilot reported that, prior to the accident, they had performed several autorotations and normal approaches to sites chosen by the instructor in the Santa Fe flood control basin. He was flying the helicopter and the instructor was following on the controls. They were performing a normal approach when both he and the flight instructor were startled to see wires in front of them. He said that the instructor took control of the helicopter. The student recalled flying under one power line that he viewed high on the windshield and then the instructor made a pull-up and the rotor impacted a second group of wires. The student reported there were no mechanical problems with the aircraft prior to impacting the wires.

A witness who observed the accident from the freeway transition road northwest of the accident site reported that the aircraft was travelling toward her (northwest) and was descending as though intending to land. When the helicopter struck the wires there were brilliant white flashes and then the aircraft fell to the ground.

Another witness who was driving northbound on the 605 freeway observed the helicopter approach from his right on a westerly heading prior to impacting the wires.

PERSONNEL INFORMATION

The pilot/flight instructor received her commercial rotorcraft rating on January 23, 1997, and her flight instructor certificate (rotorcraft/helicopter) on February 6, 1997. She learned to fly at California Helitech, the operator, and subsequently became a flight instructor there on March 10, 1997. She had since accumulated approximately 570 hours as a flight instructor at California Helitech. According to the operator she routinely, almost daily, flew in the practice area of the Santa Fe flood control basin and was very well aware of the presence of the power transmission wires.

According to the pilot's logbook, and the operator's records for the 2 days prior to the accident, the pilot had flown 175 hours in the previous 90 days, 93 hours in the previous 30 days, 28 hours in the previous 7 days, and approximately 4 hours in the previous 24 hours. According to

the operator, the accident flight was her second flight of that day; the previous flight and the accident flight each being about 1 hour in duration. According to her logbook, her last day off the job (no flying time logged) was Sunday, April 26, 1998.

The operator reported that the student pilot was visiting from Japan for a brief time and was taking flight instruction to determine if he wanted to return at a later date to complete training for his pilot's license. He arrived in the United States on April 25, 1998, and was scheduled to return to Japan on May 4, 1998. His return was delayed by events surrounding the accident. He had no prior flying experience and his ability to converse in the English language was limited.

METEOROLOGICAL INFORMATION

The hourly weather observation taken 16 minutes before the accident at El Monte airport, 5 miles southwest of the accident site, was clear skies, 7 miles visibility, and surface wind from the south at 6 knots.

An initial responder at the accident site reported that smoke from the fire was drifting to the north.

WRECKAGE AND IMPACT INFORMATION

The aircraft impacted in a level, arid area at the northern end of the Santa Fe flood control basin southeast of the intersection of the 605 and 210 freeways. The accident site is at latitude 34 degrees 07.82 minutes north, and longitude 117 degrees 57.37 minutes west (GPS). All of the wreckage was present within a 300-foot area and there was a postimpact fire.

The site is in proximity of two sets of high voltage power transmission cables that are aligned from northeast to southwest. The northern most of the two sets passes approximately 60 feet south of the accident site and the second set approximately 135 feet south. The helicopter did not impact the second (southern) set.

The northern set of wires, identified by a Southern California Edison Company spokesman as the Antelope-Mesa line, consists of three 605 ACSR (aluminum conductor, steel reinforced) type conductors with 220 kilovolt potential between wires (phases). Each conductor is approximately 1 inch in diameter and, according to the Edison lineman, consists of 30 strands of aluminum wire around a 19-strand steel core cable. The three conductors hang suspended from towers approximately 90 feet tall using ceramic insulators and are approximately 75 feet above ground level at the tower. The three conductors are lined abreast of one another with 23-foot lateral separation. In addition to these three conductors there are two ground wires which run from the top of each tower. The ground wires are spaced laterally in between the power conductors that hang approximately 15 feet below them. At the accident site, in between towers, the lower (power conductor) wires sagged to approximately 65 feet above ground level.

Near the accident site there are five wires; three power conductors approximately 65 feet agl spaced 23 feet apart and two ground wires above them approximately 15 feet and laterally in between the lower power conductors. The center wire of the lower three was severed, and the southern of the three had impact damage to several strands but did not break. The northern most of the three power conductor wires, nearest the fuselage wreckage, did not exhibit evidence of impact when viewed from the ground using binoculars. Similarly, the two ground wires above did not exhibit any impact marks. The individual wires of the center conductor, at the point of failure, were splayed out over approximately the last 18 inches of each end of the cable. The individual ends of the aluminum wires exhibited "necking" to a reduced diameter at the point of separation, and several individual wires had "hooks" in the ends which approximated the contour of the leading edge of the main rotor blades.

The fuselage, with the main rotor system still attached but minus the tailboom and antitorque rotor, was lying on its left side about 60 feet north of the broken center conductor, headed approximately 025 degrees (magnetic). A postcrash fire consumed the cockpit area. The fire damaged the engine accessory area, main rotor mast area, and part of one main rotor blade. The fuselage exhibited crushing damage to the left side. The left skid was broken in two places and the right skid was intact although separated from the forward cross tube assembly. There were no electrical arc marks noted on the fuselage.

The main rotor blades remained attached to the hub and the hub remained attached to the mast. Both blades exhibited electrical arcing and burn-through in the skin at numerous locations along the aft surface of the leading edge "D section" starting approximately 1 foot in from one blade tip and extending to the other tip's trailing edge. The hub showed evidence of arcing on the inner surfaces in proximity of the blade flapping hinges. One blade (s/n 6639A) was straight and was laying on the surface, and was fire damaged where it passed in proximity of the cockpit area fire. This blade had a 1-inch radius dent in the forward upper surface of the rotor spar about 1 foot from the tip that was accompanied by electrical arcing. A scrape mark on the leading edge of the rotor over the 3-foot span inboard of the dent exhibited a braided appearance. The other blade (s/n 6643A) was bent in two locations and folded under the rotor mast. This blade exhibited burn-through along its span with a burn mark at the tip of the trailing edge.

The tail boom, tail rotor drive shaft, and tail rotor assembly were located in pieces over approximately a 150-foot radius to the northwest through east of the fuselage wreckage. The tail rotor, tail rotor gearbox, and aft 3 feet of the tailcone were located approximately 50 feet northwest of the fuselage. The tail rotor blades remained attached and did not exhibit chordwise striations. The tail boom, when laid together, exhibited a dent in the left side extending from the upper front to lower rear at the mid-length of the tailcone. The dent was accompanied by yellow paint transfer and the radius of the dent was approximately equal to the diameter of the main rotor leading edge.

The flight control push-pull tubes in the cockpit area were consumed by fire; however, the rod

end bearings were located with the tube end fittings in place. At the swashplate all control rod ends were intact except one drive link rod end which exhibited bending in the threaded area where it separated. Aft of the cockpit the antitorque push-pull tubes were broken in several locations. The breaks exhibited bending and were at stations corresponding to locations where the tail boom separated. The tail rotor antitorque pitch change mechanism was intact.

ADDITIONAL INFORMATION

An autopsy was performed on the pilot by the Los Angeles County Coroner's Office and the FAA Civil Aeromedical Institute performed a toxicological analysis.

The aircraft wreckage was released to Mr. Jerry Wallace, representing the insurer, on June 4, 1998.

Pilot Information

Certificate:	Commercial	**Age:**	28,Female
Airplane Rating(s):	None	**Seat Occupied:**	Left
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	
Instrument Rating(s):	None	**Second Pilot Present:**	Yes
Instructor Rating(s):	Helicopter	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 Valid Medical--no waivers/lim.	**Last FAA Medical Exam:**	January 7, 1998
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	798 hours (Total, all aircraft), 637 hours (Total, this make and model), 727 hours (Pilot In Command, all aircraft), 175 hours (Last 90 days, all aircraft), 93 hours (Last 30 days, all aircraft), 4 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Robinson	**Registration:**	N8365D
Model/Series:	R22 R22	**Aircraft Category:**	Helicopter
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	313
Landing Gear Type:	Skid	**Seats:**	2
Date/Type of Last Inspection:	April 26, 1998 100 hour	**Certified Max Gross Wt.:**	1300 lbs
Time Since Last Inspection:	20 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	2486 Hrs	**Engine Manufacturer:**	Lycoming
ELT:	Installed	**Engine Model/Series:**	O-320-B2C
Registered Owner:	WILLIAM R. PAGE, MD, INC.	**Rated Power:**	160 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:	EMT ,296 ft msl	**Distance from Accident Site:**	5 Nautical Miles
Observation Time:	13:46 Local	**Direction from Accident Site:**	223°
Lowest Cloud Condition:	Clear	**Visibility**	7 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	6 knots / None	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	190°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30 inches Hg	**Temperature/Dew Point:**	
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	LA VERNE (POC)	**Type of Flight Plan Filed:**	Company VFR
Destination:		**Type of Clearance:**	None
Departure Time:	13:15 Local	**Type of Airspace:**	Class G

Airport Information

Airport:		**Runway Surface Type:**	
Airport Elevation:		**Runway Surface Condition:**	
Runway Used:	0	**IFR Approach:**	
Runway Length/Width:		**VFR Approach/Landing:**	

Wreckage and Impact Information

Crew Injuries:	1 Fatal, 1 Serious	**Aircraft Damage:**	Destroyed
Passenger Injuries:		**Aircraft Fire:**	On-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal, 1 Serious	**Latitude, Longitude:**	34.090869,-117.960327(est)

Administrative Information

Investigator In Charge (IIC):	Parker, Richard
Additional Participating Persons:	STEPHEN L FORD; LOS ANGELES , CA ANDREW LIZAMA; TORRANCE , CA
Original Publish Date:	February 15, 2001
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=29948