



National Transportation Safety Board Aviation Accident Final Report

Location:	Ojai, CA	Accident Number:	LAX07TA001
Date & Time:	10/01/2006, 1100 PDT	Registration:	N189AC
Aircraft:	Erickson S64E	Aircraft Damage:	Substantial
Defining Event:		Injuries:	2 Minor
Flight Conducted Under:	Public Aircraft		

Analysis

The helicopter snorkel snagged on a dip tank and the pilot-in-command (PIC) lost control of the helicopter during a retardant dropping mission. The tank and the snorkel screen fitting both contained 90-degree edges, which allowed them to catch on one another, once they came into contact. These abrupt edges may have increased the likelihood of a snagged condition during flight. The PIC was positioning the helicopter into a second tank and the snorkel became caught on the tank. The PIC applied power and shortly thereafter, the helicopter impacted the ground on its right side. Normal procedures following a caught snorkel are to slowly maneuver the helicopter until the snag becomes free. The PIC had reported 1,620 hours of pilot-in-command (PIC) time in helicopters on his application.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot-in-command's improper remedial action, which resulted in a loss of helicopter control. Contributing factors were the retardant tank and snorkel designs.

Findings

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

Findings

1. (F) EXTERNAL LOAD CABLE/HOOK - SNAGGED
 2. (F) AERIAL APPLICATION EQUIPMENT - SNAGGED
 3. (C) REMEDIAL ACTION - IMPROPER - PILOT IN COMMAND
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Occurrence #2: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: MANEUVERING - AERIAL APPLICATION

Findings

4. (C) AIRCRAFT CONTROL - NOT MAINTAINED - PILOT IN COMMAND
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Occurrence #3: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

Findings

5. TERRAIN CONDITION - GROUND

Factual Information

On October 1, 2006, at 1100 Pacific daylight time, the snorkel of an Erickson S64E, N189AC, snagged on a dip tank and the helicopter rolled onto the ground during fire suppression activities about 7 nautical miles north-northeast of Ojai, California. The United States Department of Agriculture (USDA)/United States Forest Service (USFS) was operating the helicopter as a public-use firefighting flight mission under the provisions of 14 Code of Federal Regulations Part 91. Erickson Air-Crane, Inc., was the registered owner of the helicopter and employed the flight crew. The commercial certificated pilot-in-command (PIC) and second-in-command (SIC), sustained minor injuries; the helicopter sustained substantial damage. Visual meteorological conditions prevailed, and a USFS flight plan had been filed. The flight crew was in contact with USFS local air traffic coordination personnel. The helicopter departed from the Lockwood helibase for a retardant dropping mission at 1000.

Based on interviews with the flight crew and on-scene examinations, the USFS reported that the helicopter drafted approximately 200 gallons of remaining retardant from a tank. The PIC then repositioned the helicopter to a second tank that was holding fresh water. While maneuvering the helicopter into the second tank, the snorkel became lodged on a metal 3.5-inch by 3.25-inch tank support ring and the lifting eye attached to the ring. As the snorkel became lodged, the nose of the helicopter pitched down and the PIC pulled aft cyclic and additional collective. The nose of the helicopter responded in a left bank, nose-high attitude. The tail stinger contacted the ground and the helicopter spun to the left. Two of the tail rotor blades were severed approximately 12 inches from the root end. The helicopter continued spinning to the left and the tail rotor head contacted the retardant tank. The helicopter came to rest on its right side.

The dip tank exterior was encircled by two support rings, which went around the top perimeter of the tank. The support rings had 90-degree lips. Two lifting eyes, spaced 180 degrees apart, were welded to these support rings. The snorkel installation was through supplemental type certificate. The snorkel tip contained a screen to prevent foreign object ingestion. This screen had a 90-degree upper lip. Scrape marks were evident on the upper ring of the tank moving toward one of the lifting eyes. Investigators also noted damage to the snorkel tip and area of the lifting eye on the tank.

The PIC reported that the approach to the retardant tank was normal and the crew was on their fifth or sixth drop. The mission was to unload the retardant tank. The helicopter drafted 200 gallons of retardant and he elected to pick up out of the retardant tank in order to take on some fresh water. He moved from the retardant tank to the fresh water tank and noted that the helicopter was low. He added power to bring the snorkel up into the water tank and it caught on the side of the tank. The PIC believed that he had felt it come loose. He brought in power and the nose of the helicopter pitched down. At that time, the PIC stated that he, "...lost the tail..." and the helicopter began to spin. He called for throttles off and he lowered the collective, unloaded the system, and transitioned the helicopter to the ground. When the helicopter contacted the ground, the right gear leg broke. The PIC stated that it was not gusty and there were no visibility restrictions.

The SIC (who was qualified to serve as PIC in the accident helicopter) stated that there were two tanks at the dip site; one tank contained water and one tank contained retardant. On the last load, they were able to take on 200 gallons of retardant. They maneuvered to the water

tank in order to add water to the retardant. They hover taxied to the water tank and when they arrived over the tank, the SIC felt a tug or jolt which he assumed to be the snorkel contacting the tank. He could not see the snorkel head at that time. Immediately following the tug, the nose pitched down and to the left. He came onto the controls with the PIC and believes that they both applied aft cyclic. The SIC indicated that he thought that power should have been reduced; however, when the PIC and SIC were pulling aft on the cyclic, he felt the PIC increase the collective. Then, the nose pitched up excessively and the SIC thought that the tail may impact the ground because of the low altitude of the helicopter. The right gear then contacted the ground and the main rotor blades impacted the ground as the helicopter rolled to the right. Furthermore, the SIC indicated that he had a previous occurrence involving a caught snorkel on a tank. In that occurrence, he reduced the power and moved away from the tank. The SIC did not recall the helicopter spinning or feel that there were any malfunctions with the tail rotor. The SIC had been working in external load operations for the past 10 years.

Review of the PIC's flight times as entered on the USFS FS 5700-20a application differed from those entered on Federal Aviation Administration (FAA) form OMB No. 2120-0021, Airman Certificate and/or Rating Application. On the FAA form for a type rating in the accident helicopter make/model dated October 24, 2005, the pilot reported 1,010.3 hours total helicopter time; 832.5 hours SIC time; and 177.8 hours PIC time. Comparisons of the pilot's logbook with the times submitted on the FAA form showed a total time of 1,010.3 hours.

On the pilot's USFS application dated October 14, 2006, he reported the following: 1,620 hours helicopter PIC; 200 hours PIC in make/model and series; and 700 hours PIC in helicopters over 12,500 pounds gross weight. A review of the PIC's logbook from the date of the FAA application, showed a cumulative time of 301.7 hours helicopter PIC.

On September 14, 2006, the PIC's total PIC flight time listed for helicopters and fixed-wing aircraft was listed as 1,534.4 hours as indicated in his personal flight logbook.

The PIC was interviewed via telephone by the National Transportation Safety Board investigator about the flight time differences between his USFS application, the FAA application, and personal flight time logbook. He indicated that when he completed the USFS form he was in the field and told to quickly complete the form. He said that he must have misunderstood what the form was asking regarding PIC times. The PIC indicated that his flight log showed his correct flight times. He further stated that he was familiar with the USFS requirements of 1,500 hours PIC time but he believed the required time could be a combination of helicopter and fixed-wing time. The pilot stated that he had flown similar operations as SIC for 5 to 6 years.

Per the USFS contract, both the PIC and SIC would be long line (vertical reference) qualified. Neither of the pilots was currently carded for long line operations. In addition, USFS PIC time contract requirements include 1,500 hours PIC.

According to a USFS regional aviation safety manager, normal procedures following a caught snorkel are to slowly maneuver the helicopter until the snag becomes free. At the time of the accident, there were no widely distributed USFS published procedures on pilot actions following a snagged snorkel condition.

Pilot Information

Certificate:	Commercial	Age:	40, Male
Airplane Rating(s):	Single-engine Land	Seat Occupied:	Left
Other Aircraft Rating(s):	Helicopter	Restraint Used:	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 2 Without Waivers/Limitations	Last FAA Medical Exam:	03/01/2006
Occupational Pilot:		Last Flight Review or Equivalent:	08/01/2006
Flight Time:	1291 hours (Total, all aircraft), 309 hours (Pilot In Command, all aircraft)		

Co-Pilot Information

Certificate:	Flight Instructor; Commercial	Age:	48, Male
Airplane Rating(s):	None	Seat Occupied:	Right
Other Aircraft Rating(s):	Helicopter	Restraint Used:	Seatbelt, Shoulder harness
Instrument Rating(s):	Helicopter	Second Pilot Present:	Yes
Instructor Rating(s):	Helicopter	Toxicology Performed:	No
Medical Certification:	Class 2 With Waivers/Limitations	Last FAA Medical Exam:	06/01/2005
Occupational Pilot:		Last Flight Review or Equivalent:	07/01/2005
Flight Time:	4445 hours (Total, all aircraft), 525 hours (Total, this make and model), 4244 hours (Pilot In Command, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Erickson	Registration:	N189AC
Model/Series:	S64E	Aircraft Category:	Helicopter
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Transport	Serial Number:	641001
Landing Gear Type:	Tricycle	Seats:	2
Date/Type of Last Inspection:	09/01/2006, Continuous Airworthiness	Certified Max Gross Wt.:	42000 lbs
Time Since Last Inspection:		Engines:	2 Turbo Shaft
Airframe Total Time:	5209 Hours as of last inspection	Engine Manufacturer:	Pratt & Whitney
ELT:	Installed, activated, did not aid in locating accident	Engine Model/Series:	JFD12A-4A
Registered Owner:	Erickson Air Crane	Rated Power:	4500 hp
Operator:	USDA- USFS	Operating Certificate(s) Held:	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	OXR, 45 ft msl	Distance from Accident Site:	20 Nautical Miles
Observation Time:	1051 PDT	Direction from Accident Site:	150°
Lowest Cloud Condition:	Clear	Visibility	6 Miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	18 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	280°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30.01 inches Hg	Temperature/Dew Point:	17° C / 14° C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Lockwood Heliba, CA	Type of Flight Plan Filed:	VFR
Destination:	Ojai, CA	Type of Clearance:	None
Departure Time:	1000 PDT	Type of Airspace:	

Wreckage and Impact Information

Crew Injuries:	2 Minor	Aircraft Damage:	Substantial
Passenger Injuries:	N/A	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	2 Minor	Latitude, Longitude:	34.548333, -119.186667

Administrative Information

Investigator In Charge (IIC):	Kristi Dunks	Report Date:	08/30/2007
Additional Participating Persons:	Terrence McMaster; Federal Aviation Administration; Van Nuys, CA James Morrison; United States Forest Service; Ogden, UT		
Publish Date:			
Investigation Docket:	NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at pubinq@ntsb.gov , or at 800-877-6799. Dockets released after this date are available at http://dms.nts.gov/pubdms/ .		

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The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available [here](#).