



National Transportation Safety Board Aviation Accident Final Report

Location:	PENDLETON, OR	Accident Number:	SEA00FA014
Date & Time:	11/02/1999, 1532 PST	Registration:	N635H
Aircraft:	Enstrom F28C	Aircraft Damage:	Destroyed
Defining Event:		Injuries:	1 Fatal

Flight Conducted Under: Part 91: General Aviation - Instructional

Analysis

The helicopter was destroyed when it sustained a tail rotor blade strike during a solo instructional flight. The airline transport pilot, who was preparing for a commercial rotorcraft-helicopter rating checkride on the following day, was fatally injured. The pilot was on his second left-hand circuit of the pattern and had been cleared for the option. On his first circuit, he had made three touchdowns along the length of the runway, at the threshold, mid-length, and at the departure end, then had continued his circuit. On the second circuit, the tower controller had again cleared the pilot for the option. The tower controller observed similar touchdowns at the threshold, and at mid-field. He stated that he was looking away at the time of the crash; however he heard a very garbled transmission, looked in the direction of the helicopter, saw dirt flying, and activated the siren and dispatched rescue vehicles. Ground strikes consistent with tail rotor blade strikes were found near the wreckage.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: Failure to maintain clearance from the runway surface while maneuvering at low altitude, and inadequate remedial action after the tail rotor struck the surface.

Findings

Occurrence #1: DRAGGED WING, ROTOR, POD, FLOAT OR TAIL/SKID
Phase of Operation: MANEUVERING

Findings

1. (C) CLEARANCE - NOT MAINTAINED - PILOT IN COMMAND

Occurrence #2: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: MANEUVERING

Findings

2. (C) REMEDIAL ACTION - INADEQUATE - PILOT IN COMMAND

Occurrence #3: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

Factual Information

HISTORY OF FLIGHT

On November 2, 1999, at 1532 Pacific standard time, an Enstrom F28C helicopter, N635H, was destroyed when it sustained a tail rotor blade strike during a solo instructional flight at Pendleton airport, Pendleton, Oregon. The airline transport pilot, who was preparing for a commercial rotorcraft-helicopter rating, was fatally injured. The helicopter was registered to Charlie Inc., an entity of which the pilot was a principal. Visual meteorological conditions prevailed at the time of the flight. No flight plan was filed. There was a post-impact fire. No ELT was installed in the aircraft.

According to the pilot's flight instructor, he had accumulated approximately 66.5 hours of helicopter instruction, and was scheduled for an add-on commercial rating on the day following the accident. The instructor had flown once with the pilot for 1.7 hours the morning of the flight. The pilot had then flown again for approximately an hour in an additional flight before the accident flight. On the accident flight, the pilot was on his second left-hand circuit of the pattern for runway 34. According to the tower controller, the pilot had been cleared for the option on runway 34 on his first circuit. He had made three touchdowns along the length of runway 34, at the threshold, mid-length, and at the departure end of the runway, then had continued his circuit. On the second circuit, the tower controller had again cleared the pilot for the option. The tower controller observed similar touchdowns at the threshold, and at mid-field. He stated that he was looking away at the time of the crash; however he heard a very garbled transmission, looked in the direction of the helicopter, saw dirt flying, and activated the siren and dispatched rescue vehicles. He then saw smoke and flames.

Ground strikes consistent with tail rotor blade strikes were found near the wreckage. Both tail rotor blades separated from the tail rotor hub, and the tail rotor gearbox also separated from the tailcone. The pilot was at least partially ejected from the helicopter's cockpit and was partially beneath the fuselage when rescuers arrived. Rescuers lifted the fuselage and pulled him from the burning wreckage.

WRECKAGE AND IMPACT INFORMATION

The wreckage was located along the east edge of runway 34, a few hundred feet from the departure end of the runway. Two groups or sets of surface scars were found on the asphalt runway surface. The first set included a gouge estimated to be about 1/4 inch deep and one inch in diameter, with a 4-5 inch scratch or metal and paint transfer. A few inches away were three other scrapes or gouges. This set of marks was to the right of the runway centerline. The second surface scar location was about 20 yards closer to the departure end of the runway, and on the left side of the runway centerline, consisting of another similar crater, with an associated 4-5 inch scratch mark. In both instances, flecks of paint and material similar to that used for tail-rotor bonding were found in the vicinity.

One tail rotor blade, including the grip, was found a few yards from the first surface scars, closer to the approach end of the runway. The tail rotor gearbox was found about twenty yards north of the second surface scar, also on the left side of the runway centerline. The second tail rotor blade was found beyond the gearbox, again to the left of the runway centerline.

The tail rotor blade nearest the approach end of the runway exhibited large radius bending, and two separate areas of compression folds on the trailing edge. The other tail rotor blade

exhibited trailing edge folding, large radius bending from about mid-span, and leading edge crushing and impact signatures.

The tail rotor gearbox exhibited a broken casting, and the two associated control cables exhibited signatures similar to tensile overload. One blade grip remained attached to the spindle; the other blade grip remained with the other rotor blade.

The fuselage was found laying on its left side, with the tailboom separated from the fuselage aft of the engine. The upper fuselage and cockpit area exhibited fire damage, as did both the upper and lower area aft of the passenger compartment bulkhead. The belly exhibited arcing scratches in the paint and crushing. The left skid was folded beneath the fuselage. The right skid was bent forward of the front attachment point; the forward portion of that skid exhibited abrasion and scratches at an angle to the skid tube's longitudinal axis.

The tail rotor hoop had separated into two main pieces, which were located separately in the wreckage distribution. No evidence of scratches, scoring, or paint transfer was observed on the outer surface of the hoop.

Control continuity was established from the cyclic and collective controls to the swash plate. Pedal cables were, as earlier described separated.

All three main rotor blades exhibited tip damage and delamination consistent with blade strikes. No pre-impact mechanical anomalies were noted during the on-scene investigation.

The helicopter was equipped with seat belts. No evidence of installed shoulder harnesses was found. The pilot's seat belt buckle remained buckled when observed at the accident scene. The belt was found outside the aircraft. Its right-side attachment point remained clasped on its attachment point; however the attachment point had separated from the airframe. The other end of the belt exhibited melting and separation.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy of the pilot was performed November 3, 1999 by Dr. James B. Sawyer of Blue Mountain Pathology, Inc., in Pendleton, Oregon. Toxicological testing was conducted by the FAA laboratory, with negative results for carbon monoxide, cyanide, and ethanol.

FIRE

The tower controller activated the siren and dispatched fire/rescue personnel after observing the crash. Vehicles were en route to the accident scene within 4 minutes of notification. The fire was suppressed using foam.

ADDITIONAL DATA/INFORMATION

The wreckage was released to the insurance adjuster, as owner's representative, on November 4, 1999, after inspection by investigators. At the time of release the wreckage was located at the General Aircraft Services, Inc., facility in Pendleton, Oregon.

Pilot Information

Certificate:	Airline Transport	Age:	46, Male
Airplane Rating(s):	Multi-engine Sea; Single-engine Land; Single-engine Sea	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	Seatbelt
Instrument Rating(s):	Airplane	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	Yes
Medical Certification:	Class 2 Valid Medical--no waivers/lim.	Last FAA Medical Exam:	05/10/1999
Occupational Pilot:		Last Flight Review or Equivalent:	
Flight Time:	15000 hours (Total, all aircraft), 66 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Make:	Enstrom	Registration:	N635H
Model/Series:	F28C F28C	Aircraft Category:	Helicopter
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	386
Landing Gear Type:	Skid	Seats:	3
Date/Type of Last Inspection:	10/21/1999, Annual	Certified Max Gross Wt.:	2350 lbs
Time Since Last Inspection:	20 Hours	Engines:	1 Reciprocating
Airframe Total Time:	1557 Hours	Engine Manufacturer:	Lycoming
ELT:	Not installed	Engine Model/Series:	IO-360-E1BD
Registered Owner:	CHARLIE INC	Rated Power:	205 hp
Operator:	CHARLIE INC	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	KPD, 1494 ft msl	Distance from Accident Site:	0 Nautical Miles
Observation Time:	1456 PST	Direction from Accident Site:	0°
Lowest Cloud Condition:	Clear / 0 ft agl	Visibility	10 Miles
Lowest Ceiling:	None / 0 ft agl	Visibility (RVR):	0 ft
Wind Speed/Gusts:	6 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	360°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30 inches Hg	Temperature/Dew Point:	10° C / -1° C
Precipitation and Obscuration:			
Departure Point:	(KPDT)	Type of Flight Plan Filed:	None
Destination:		Type of Clearance:	None
Departure Time:	1520 PST	Type of Airspace:	Class D

Airport Information

Airport:	PENDLETON (KPWT)	Runway Surface Type:	Asphalt
Airport Elevation:	1494 ft	Runway Surface Condition:	
Runway Used:	34	IFR Approach:	None
Runway Length/Width:	4159 ft / 75 ft	VFR Approach/Landing:	Stop and Go

Wreckage and Impact Information

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

Administrative Information

Investigator In Charge (IIC):	MICHAEL L STOCKHILL	Report Date:	05/09/2001
Additional Participating Persons:	TERRY WILMETH; HILLSBORO, OR BILL TAYLOR; MENOMINEE, MI		
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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