



National Transportation Safety Board Aviation Accident Final Report

Location:	Kankakee, IL	Accident Number:	CHI03LA240
Date & Time:	08/02/2003, 1755 CDT	Registration:	N15SA
Aircraft:	Enstrom F-28C	Aircraft Damage:	Substantial
Defining Event:		Injuries:	3 Minor, 1 None

Flight Conducted Under: Part 91: General Aviation - Other Work Use - Sightseeing

Analysis

The sightseeing aerial observation helicopter sustained substantial damage when the main rotor impacted the tail rotor drive shaft during a landing in a county fairground parking lot. The tail rotor drive shaft separated from the helicopter. The tail rotor drive shaft impacted the rear window of a vehicle parked in the parking lot. Three passengers reported minor injuries and the pilot reported that he was uninjured. The pilot stated, "I made a stabilized steep approach to the landing area. Once I detected the helicopter skids come in contact with the surface I lowered the collective at that moment the helicopter dropped and lunged forward. The landing site was a nearly level area with 2-3 inch tall grass." Wind was 170 degrees at 7 knots. An on-scene examination of the helicopter detected no pre-impact anomalies. The helicopter's flight manual stated, "The cabin interior is a full, three-place, side by side seating arrangement." The helicopter's center of gravity range was 92.0 to 100 inches. The operator's calculated center of gravity was 91.74 inches.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot misjudged flare which led to a hard landing. Contributing to the accident was the pilot's failure to follow procedures/directives when he exceeded the airplane's weight and balance.

Findings

Occurrence #1: HARD LANDING

Phase of Operation: LANDING

Findings

1. (C) ROTOR SYSTEM,MAIN ROTOR BLADE - OTHER
2. (F) PROCEDURES/DIRECTIVES - NOT FOLLOWED - PILOT IN COMMAND
3. (C) FLARE - MISJUDGED - PILOT IN COMMAND
4. (F) AIRCRAFT WEIGHT AND BALANCE - EXCEEDED - PILOT IN COMMAND

Occurrence #2: ON GROUND/WATER COLLISION WITH OBJECT

Phase of Operation: LANDING

Findings

5. OBJECT - VEHICLE

Factual Information

On August 2, 2003, about 1755 central daylight time, an Enstrom F-28C helicopter, N15SA, piloted by a commercial pilot, sustained substantial damage when the main rotor impacted the tail rotor drive shaft during a landing in a county fairground parking lot near Kankakee, Illinois. The tail rotor drive shaft separated from the helicopter and impacted the rear window of a vehicle parked in the parking lot. The aerial observation flight was operating under 14 CFR Part 91. Visual meteorological conditions prevailed at the time of the accident. No flight plan was on file. Three passengers reported minor injuries and the pilot reported that he was uninjured. The local sightseeing flight originated from the parking lot near Kankakee, Illinois, at time unknown and was returning to land at that parking lot when the accident occurred.

The pilot stated:

I was conducting helicopter rides at the fair ground. I made a stabilized steep approach to the landing area. Once I detected the helicopter skids come in contact with the surface I lowered the collective at that moment the helicopter dropped and lunged forward. The landing site was a nearly level area with 2-3 inch tall grass.

An on-scene examination of the helicopter was performed. The helicopter was found resting in a grass area roped off for landing. The landing gear skid assemblies were not deformed. No depressions were found in the grass area around the skids. One rotor blade exhibited leading edge nicks and a red colored media transfer on its outboard section. The push-pull tube for that blade was found with its rod end separated from its assembly. The blade's drag link was found with one fork end fractured. Control continuity was established from the cockpit to the other two blades. The push-pull tube with the separation was observed to move in correct relationship to the movement of the cockpit controls. The tail rotor drive shaft was found in the parking lot adjacent to the landing area. The tail rotor drive shaft ends exhibited tears consistent with overload. The tail rotor drive shaft's color scheme was red. The rear section of the tail boom was found torn from its forward section about the splice joint aft of the stabilizer's carry through spar. Both rudder cables were intact at the tail rotor gearbox assembly and moved in correct relationship to movements of the rudder pedals. A deformed strobe light assembly was found on the ground. The examination of the helicopter detected no pre-impact anomalies.

The helicopter operator supplied weight and balance data to the Federal Aviation Administration. The helicopter's center of gravity range was 92.0 to 100 inches. The operator's calculated center of gravity was 91.74 inches.

At 1803, the Greater Kankakee Airport, about two miles north of the accident site, near Kankakee, Illinois, recorded weather was: Wind 170 degrees at 7 knots; visibility 10 statute miles; sky condition clear; temperature 22 degrees C; dew point 20 degrees C; altimeter 29.90 inches of mercury.

Excerpts from the helicopter's flight manual stated:

INTERIOR ARRANGEMENT

The cabin interior is a full, three-place, side by side seating arrangement with a spacious 61" width for maximum pilot and passenger comfort.

Pilot Information

Certificate:	Flight Instructor; Commercial	Age:	44, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Seat Occupied:	Left
Other Aircraft Rating(s):	Helicopter	Restraint Used:	Seatbelt
Instrument Rating(s):	Airplane	Second Pilot Present:	No
Instructor Rating(s):	Airplane Single-engine; Helicopter	Toxicology Performed:	No
Medical Certification:	Class 2 Valid Medical--w/ waivers/lim.	Last FAA Medical Exam:	09/17/2002
Occupational Pilot:		Last Flight Review or Equivalent:	07/02/2003
Flight Time:	1771 hours (Total, all aircraft), 125 hours (Total, this make and model), 1771 hours (Pilot In Command, all aircraft), 82 hours (Last 90 days, all aircraft), 51 hours (Last 30 days, all aircraft), 9 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Enstrom	Registration:	N15SA
Model/Series:	F-28C	Aircraft Category:	Helicopter
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	469
Landing Gear Type:	Skid	Seats:	3
Date/Type of Last Inspection:	06/05/2003, Annual	Certified Max Gross Wt.:	2350 lbs
Time Since Last Inspection:	90.5 Hours	Engines:	1 Reciprocating
Airframe Total Time:	4915.7 Hours at time of accident	Engine Manufacturer:	Lycoming
ELT:		Engine Model/Series:	HIO360E1AD
Registered Owner:	Hartford Holding Corp	Rated Power:	205 hp
Operator:	Spitfire Aerospace Technologies Inc.	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	IKK, 630 ft msl	Distance from Accident Site:	2 Nautical Miles
Observation Time:	1803 CDT	Direction from Accident Site:	360°
Lowest Cloud Condition:	Clear	Visibility	10 Miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	7 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	170°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29.9 inches Hg	Temperature/Dew Point:	22° C / 20° C
Precipitation and Obscuration:			
Departure Point:	Kankakee, IL	Type of Flight Plan Filed:	None
Destination:		Type of Clearance:	None
Departure Time:	CDT	Type of Airspace:	Class G

Airport Information

Airport:	GREATER KANKAKEE (IKK)	Runway Surface Type:	Grass/turf
Airport Elevation:	630 ft	Runway Surface Condition:	Dry
Runway Used:		IFR Approach:	None
Runway Length/Width:		VFR Approach/Landing:	Full Stop

Wreckage and Impact Information

Crew Injuries:	1 None	Aircraft Damage:	Substantial
Passenger Injuries:	3 Minor	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	3 Minor, 1 None	Latitude, Longitude:	41.071389, -87.846389

Administrative Information

Investigator In Charge (IIC):	Edward F Malinowski	Report Date:	03/02/2004
Additional Participating Persons:	Bob Donahue; Federal Aviation Administration; West Chicago, IL		
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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