Aviation Investigation Final Report

Location:	HOUSTON, Texas	**Accident Number:**	FTW99TA190
Date & Time:	July 14, 1999, 21:51 Local	**Registration:**	N7491F
Aircraft:	Hughes 269C	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	1 Minor, 1 None
Flight Conducted Under:	Part 91: General aviation - Instructional		

Analysis

During a night instructional flight, the helicopter landed hard during a practice autorotation following a simulated engine failure during takeoff. The operator stated that the toe of the right landing gear skid sank into the ground, and the helicopter made a 90 degree turn. The main rotor blades made contact with and severed the tailboom of the helicopter. The operator reported that the maneuver was entered below the recommended airspeed of 60 knots, and consequently a high rate of sink developed during the landing flare, which the pilot receiving instruction was unable to arrest. No mechanical malfunction or failure was reported by either the pilot or the operator.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The hard landing as a result of the flight instructor's failure to attain the proper airspeed before simulating an engine failure, which resulted in the development of a high sink rate. Factors were the night illumination and the soft ground.

Findings

Occurrence #1: HARD LANDING
Phase of Operation: LANDING - FLARE/TOUCHDOWN

Findings
1. (F) LIGHT CONDITION - NIGHT

2. (C) AIRSPEED - NOT ATTAINED - PILOT IN COMMAND(CFI)
3. EMERGENCY PROCEDURE - SIMULATED - PILOT IN COMMAND(CFI)
4. AUTOROTATION - INITIATED - DUAL STUDENT
5. (C) PROPER DESCENT RATE - NOT POSSIBLE - DUAL STUDENT
6. (F) TERRAIN CONDITION - SOFT
7. MISC ROTORCRAFT,MAIN ROTOR/TAIL BOOM CONTACT

Factual Information

On July 14, 1999, at 2151 central daylight time, a Hughes 269C helicopter, N7491F, was substantially damaged during a hard landing at the Houston Hobby Airport (HOU), near Houston, Texas. The flight instructor was not injured and the commercial pilot receiving instruction sustained minor injuries. The helicopter was owned and operated by the Houston Police Department. Night visual meteorological conditions prevailed for the Title 14 CFR Part 91 instructional flight for which a company flight plan was filed. The flight originated from the Houston Hobby Airport about 30 minutes prior to the accident.

According to personnel at the airport, the helicopter was conducting night training operations as part of the night check out for the 281-hour pilot receiving instruction. The helicopter had been cleared by Houston Hobby Control Tower to maneuver in the grassy area between Taxiway Golf and Runway 17, located on the west side of the airport.

The scheduled night check-out was the final phase in the pilot's training prior to being signed-off as pilot-in-command during operational missions. The scope of the check-out covered all normal and emergency operations, including full touchdown and power recovered autorotations. Simulated engine failures were initiated in all phases of the flight, to include simulated engine failures on takeoff, hovering autorotations, straight-in autorotations, 180-degree turn autorotations, and 90-degree turn autorotations.

The operator reported that a total of 12 autorotations had been satisfactorily completed during the flight. The last maneuver to be evaluated was the simulated engine failure during takeoff. This maneuver was to be initiated by the flight instructor after the helicopter had attained a minimum airspeed of 60 knots, and a minimum altitude of 50 feet agl. The maneuver was performed satisfactorily once.

In a telephone interview, the operator reported that during a second simulated engine failure during takeoff, the helicopter landed hard, the toe of the right landing gear skid sunk into the ground, and the helicopter made a 90-degree turn. The operator added that the maneuver was initiated slightly below the recommended airspeed of 60 knots, which contributed to a high rate of descent developing, which the pilot was unable to arrest during the landing flare.

The main rotor blades came in contact with the aft fuselage, severing the tailboom. The right rear landing strut collapsed; however, the helicopter remained in the upright position. No mechanical malfunction or failure was reported by either the pilot or the operator.

The FAA inspector, who responded to the accident site, confirmed that the airframe and tailboom of the helicopter sustained structural damage. A review of the helicopter's maintenance records by the FAA inspector did not reveal any evidence of overdue inspections

or uncorrected discrepancies that could have contributed to the accident.

Pilot Information

Certificate:	Commercial; Flight instructor	**Age:**	38,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	
Instrument Rating(s):	None	**Second Pilot Present:**	Yes
Instructor Rating(s):	Helicopter	**Toxicology Performed:**	No
Medical Certification:	Class 2 Valid Medical--no waivers/lim.	**Last FAA Medical Exam:**	June 15, 1999
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	3500 hours (Total, all aircraft), 300 hours (Total, this make and model), 3000 hours (Pilot In Command, all aircraft), 100 hours (Last 90 days, all aircraft), 40 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Hughes	**Registration:**	N7491F
Model/Series:	269C 269C	**Aircraft Category:**	Helicopter
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	350400
Landing Gear Type:	Skid	**Seats:**	2
Date/Type of Last Inspection:	June 15, 1999 AAIP	**Certified Max Gross Wt.:**	2050 lbs
Time Since Last Inspection:	20 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	11393 Hrs	**Engine Manufacturer:**	Lycoming
ELT:	Not installed	**Engine Model/Series:**	HIO-360-D1A
Registered Owner:	CITY OF HOUSTON	**Rated Power:**	190 Horsepower
Operator:		**Operating Certificate(s) Held:**	None
Operator Does Business As:	HOUSTON POLICE DEPARTMENT	**Operator Designator Code:**	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Night/dark
Observation Facility, Elevation:	HOU ,47 ft msl	**Distance from Accident Site:**	1 Nautical Miles
Observation Time:	21:53 Local	**Direction from Accident Site:**	90°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	5 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	170°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29 inches Hg	**Temperature/Dew Point:**	26°C / 23°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	(HOU)	**Type of Flight Plan Filed:**	Company VFR
Destination:		**Type of Clearance:**	VFR
Departure Time:	21:21 Local	**Type of Airspace:**	Class B

Airport Information

Airport:	HOUSTON HOBBY AIRPORT HOU	**Runway Surface Type:**	Grass/turf
Airport Elevation:	47 ft msl	**Runway Surface Condition:**	Soft;Wet
Runway Used:	0	**IFR Approach:**	
Runway Length/Width:	1000 ft / 150 ft	**VFR Approach/Landing:**	Simulated forced landing

Wreckage and Impact Information

Crew Injuries:	1 Minor, 1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Minor, 1 None	**Latitude, Longitude:**	29.649597,-95.279739(est)

Administrative Information

Investigator In Charge (IIC):	Casanova, Hector
Additional Participating Persons:	MICHAEL D KNUCKEY; HOUSTON , TX
Original Publish Date:	November 30, 2000
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=46791