Aviation Investigation Final Report

Location:	Lumberton, New Jersey	**Accident Number:**	ERA13LA300
Date & Time:	June 22, 2013, 15:00 Local	**Registration:**	N2091E
Aircraft:	Sikorsky 269C	**Aircraft Damage:**	Substantial
Defining Event:	Loss of engine power (partial)	**Injuries:**	1 Minor, 1 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot initiated a practice autorotation about 951 feet above ground level (agl), rolled off the throttle to the idle detent, and maintained 60 knots during the descent until 50 feet agl, at which time, he flared the helicopter. At the end of the flare, when the helicopter was about 20 to 30 feet agl, the pilot lowered the nose to level the helicopter, began to increase the collective, and rolled on the throttle for a power recovery. The pilot reported that, subsequently, the engine sounded like it was "bogging down" and that the engine rpm was not increasing enough for the helicopter to continue to come to a hover. The helicopter continued to descend and contacted the runway hard, which resulted in substantial damage to the vertical firewall. A postaccident engine run revealed no evidence of a preimpact failure or malfunction that would have precluded normal operation. According to the pilot's flight manual, when performing practice autorotations, the pilot should lower the collective while maintaining the throttle setting to prevent the engine from "loading up or stalling" during recovery. Therefore, it is likely that the pilot rolling the throttle to the idle detent at the beginning of the maneuver, which was contrary to procedures, resulted in the engine hesitating when power was applied for the recovery.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

The pilot's movement of the throttle to the idle detent at the beginning of a practice autorotation, which was contrary to procedures and resulted in the engine hesitating during the power recovery and a subsequent hard landing.

Findings

Personnel issues	Incorrect action performance - Pilot
Aircraft	Powerplant parameters - Not attained/maintained
Aircraft	(general) - Incorrect use/operation

Factual Information

History of Flight

Approach-VFR pattern final	Simulated/training event
Approach-VFR pattern final	Loss of engine power (partial) (Defining event)
Landing-flare/touchdown	Hard landing

On June 22, 2013, about 1500 eastern daylight time, a Sikorsky Aircraft Corporation (formerly Schweizer Aircraft Corporation) 269C, N2091E, registered to Herlihy Helicopters, Inc., DBA Helicopter Flight Services, was landed hard at Flying W Airport (N14), Lumberton, New Jersey. Visual meteorological conditions prevailed at the time and no flight plan was filed for the 14 Code of Federal Regulations (CFR) Part 91 personal, local flight from N14. The helicopter sustained substantial damage, and there were no injuries to the commercial rated pilot or passenger. The flight originated about 1400 from N14.

The pilot stated that the purpose of the flight was to take his friend for a 1 hour local flight who was possibly interested in taking flying lessons. Prior to departure he obtained weather information from the ASOS at South Jersey Regional Airport (VAY), and reported that at the time of takeoff the weather was clear and the wind was not a factor. The flight departed, and flew locally then returned and entered the traffic pattern where he discussed autorotations with the passenger. He informed the passenger that he would demonstrate an autorotation with a planned power recovery, and initiated it from 1,000 feet mean sea level, or 951 feet above ground level (agl), and 60 knots indicated airspeed. He rolled off throttle to the idle detent and descended maintaining 60 knots as he had been trained to do keeping the main rotor rpm in the upper green range, and at approximately 50 feet agl, he flared. At the end of the flare, or about 20 to 30 feet agl, he leveled the nose and began to increase the collective and rolled on throttle for a power recovery, but later reported the engine sounded like it was "…bogging down, and the engine [rpm] was not increasing enough to continue hold the hover." He reported that with insufficient engine rpm, the helicopter continued to descend and contacted the runway, coming to rest upright. He secured the helicopter and both occupants exited it.

The operator reported the skids were collapsed, and the vertical firewall was damaged. Following recovery of the helicopter, the engine was started by a representative of the operator with Federal Aviation Administration (FAA) oversight; the engine was found to operate normally. Following the engine run, a differential compression test of all cylinders was performed using 80 psi as a reference; all cylinders measured 70 psi or above. Further, there was no discrepancy with the throttle linkage.

The normal procedures section of the Pilot's Flight Manual indicates that when performing practice autorotations, to split the needles (main rotor and engine rpm indications) by lowering the collective but keep the throttle setting. The throttle correlation will establish a high idle rpm of approximately 2,500 which will aid in preventing the engine from loading up or stalling during recovery. The emergency procedures section of the Pilot's Flight Manual, indicates that for engine failure above 450 feet agl, to establish a steady glide of 52 knots (60 mph), and at an altitude of 50 feet, begin steadily to apply back

cyclic stick to decrease forward speed. At about 10 feet agl, coordinate collective pitch with forward movement of the cyclic stick to level the helicopter and cushion the landing.

The FAA Helicopter Flying Handbook (FAA-H-8083-21A), stipulates that when performing a practice autorotation with a power recovery, to begin to level the helicopter with forward cyclic control when it is 3 to 15 feet landing gear height agl, and just prior to achieving level attitude, coordinate upward collective pitch control with an increase in the throttle to join the needles at operating rpm. The handbook also indicates that to use sufficient collective pitch to stop the descent, but collective pitch application must be gradual to allow for engine response.

Pilot Information

Certificate:	Commercial; Flight instructor; Private	**Age:**	38
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	
Instrument Rating(s):	Helicopter	**Second Pilot Present:**	No
Instructor Rating(s):	Helicopter	**Toxicology Performed:**	No
Medical Certification:	Class 2 With waivers/limitations	**Last FAA Medical Exam:**	March 7, 2013
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	March 10, 2013
Flight Time:	316 hours (Total, all aircraft), 47 hours (Total, this make and model), 227 hours (Pilot In Command, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Sikorsky	**Registration:**	N2091E
Model/Series:	269C	**Aircraft Category:**	Helicopter
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	S1837
Landing Gear Type:	N/A; Skid	**Seats:**	3
Date/Type of Last Inspection:	June 3, 2013 100 hour	**Certified Max Gross Wt.:**	2050 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	4799 Hrs at time of accident	**Engine Manufacturer:**	LYCOMING
ELT:	Not installed	**Engine Model/Series:**	HIO-360-D1A
Registered Owner:	HERLIHY HELICOPTERS INC	**Rated Power:**	190 Horsepower
Operator:	Helicopter Flight Services	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	VAY,53 ft msl	**Distance from Accident Site:**	2 Nautical Miles
Observation Time:	14:54 Local	**Direction from Accident Site:**	298°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	3 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:		**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.21 inches Hg	**Temperature/Dew Point:**	28°C / 16°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Lumberton, NJ (N14)	**Type of Flight Plan Filed:**	None
Destination:	Lumberton, NJ (N14)	**Type of Clearance:**	None
Departure Time:	14:00 Local	**Type of Airspace:**	

Airport Information

Airport:	Flying W Airport N14	**Runway Surface Type:**	Asphalt
Airport Elevation:	49 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	19	**IFR Approach:**	None
Runway Length/Width:	3496 ft / 75 ft	**VFR Approach/Landing:**	Simulated forced landing

Wreckage and Impact Information

Crew Injuries:	1 Minor	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 None	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Minor, 1 None	**Latitude, Longitude:**	39.934165,-74.80722(est)

Administrative Information

Investigator In Charge (IIC):	Monville, Timothy
Additional Participating Persons:	Stephan Koza; FAA/FSDO; Philadelphia, PA
Original Publish Date:	February 10, 2014
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=87275