Aviation Investigation Final Report

Location:	Boise, Idaho	**Accident Number:**	SEA06LA096
Date & Time:	May 15, 2006, 15:35 Local	**Registration:**	N2096W
Aircraft:	Schweizer 269C	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	2 None
Flight Conducted Under:	Part 91: General aviation - Instructional		

Analysis

During an instructional flight, in which a practice autorotation was to be demonstrated, the instructor pilot instructed the student to reduce the throttle to idle to simulate an engine failure at altitude. During the course of the maneuver and after the throttle had been reduced to idle the instructor became aware that the engine had failed. An autorotation was completed to the ground into the wind to a grass field with a slight up slope, which resulted in the helicopter sliding backwards approximately 15 feet before the tail boom, which flexed up was impacted by the main rotor. The helicopter suffered damage to the tail boom, all three main rotor blades, and the tail rotor drive shaft. A subsequent engine run, which was overseen by two FAA inspectors, revealed no anomalies which would have precluded normal operations. The inspectors did note that while the idle rpm and idle mixture were adjusted poorly for altitude and temperature, this did not result in the loss of engine power; the instructor pilot's failure to follow the cautions in the helicopter's flight manual did result in the loss of power.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The reduction of the throttle to idle at a high density altitude during a practice autorotation, which resulted in the engine stoppage. Factors contributing to the accident included the instructor pilot's improper planning by not adhering to the flight manual's warning to avoid reducing the throttle to the idle position at high density altitudes, and the uneven terrain.

Findings

Occurrence #1: LOSS OF ENGINE POWER(TOTAL) - NONMECHANICAL
Phase of Operation: EMERGENCY LANDING

Findings
1. (C) THROTTLE/POWER CONTROL - IMPROPER USE OF - PILOT IN COMMAND(CFI)
2. (F) PROCEDURES/DIRECTIVES - NOT FOLLOWED - PILOT IN COMMAND(CFI)
3. EMERGENCY PROCEDURE - SIMULATED

Occurrence #2: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - EMERGENCY

Findings
4. (F) TERRAIN CONDITION - ROUGH/UNEVEN

Factual Information

On May 15, 2006, approximately 1535 mountain daylight time, a Schweizer 269C helicopter, N2096W, sustained substantial damage following a hard landing while performing an autorotation near Boise, Idaho. The certified helicopter instructor pilot and his student were not injured. The helicopter was registered to and operated by Aviation Specialties Limited of Boise. Visual meteorological conditions prevailed for the local instructional flight, which was operated in accordance with 14 CFR Part 91, and a flight plan was not filed. The helicopter departed from the Boise Air Terminal/Gowen Field (BOI), about 1415.

According to the Pilot/Operator Aircraft Accident/Incident Report (NTSB Form 6120.1) submitted to the NTSB investigator-in-charge (IIC), the instructor pilot reported that approximately 1.3 hours into the flight, at an altitude of 3,900 feet mean sea level (msl) or 1,000 feet above ground level (agl), the instructor pilot, who was occupying the left seat and in control of the helicopter, instructed the student, who occupied the right seat, to reduce the throttle to idle to simulate an engine failure at altitude. The instructor pilot stated that after the throttle was reduced to idle he entered an autorotation, maneuvered the helicopter into the wind, and then noticed the engine had failed. The instructor pilot reported that he decided not to attempt to do an engine restart in flight, and the autorotation was completed to the ground into the wind to a grass field with a slight up slope. The instructor pilot further reported that after the helicopter's skids impacted terrain, it slid backwards approximately 15 feet before the tail boom flexed up and was impacted by the main rotor. The hard landing resulted in substantial damage to the tail boom, all three main rotor blades, and the tail rotor drive shaft. There was no post accident fire. The aircraft was subsequently recovered to a secured area at the facilities of Aviation Specialties Limited, where a further examination by representatives of the Federal Aviation Administration (FAA) would be conducted.

On May 18, 2006, two FAA aviation safety inspectors from the Boise Flight Standards District Office, Boise, Idaho, participated in an engine run. The inspection revealed no anomalies which would have precluded normal operation of the engine. The inspectors reported that while the idle rpm and idle mixture were set for winter temperatures, and that while being adjusted poorly for the altitude and temperature on the day of the flight, the failure of the instructor pilot to follow the cautions in the helicopter's flight manual resulted in the loss of power. (Refer to attached inspector's statement)

According to the Schweizer Aircraft Corporation's Model 269C Helicopter Pilot's Flight Manual, page 4-23, #4-16, ENGINE IDLE AT ALTITUDE, revised 15 June 1994, this section states:

Engine idle speeds at high density altitude may be less than those set at sea level conditions.

WARNING: AVOID THROTTLE CHOPS TO FULL IDLE AT ALTITUDES ABOVE 7000 FEET, TO

AVOID POSSIBILITY OF ENGINE STOPPAGE. (Refer to attached Schweizer Aircraft Corporation Pilot's Flight Manual, Normal Procedures, page 4-23)

At 1524, the weather reporting facility at BOI, reported wind 140 degrees at 13 knots, visibility 10 statute miles, sky clear, temperature 33 degrees C, and a density altitude of 5,500 feet.

Flight instructor Information

Certificate:	Commercial; Flight instructor	**Age:**	57,Male
Airplane Rating(s):	Single-engine land; Single-engine sea	**Seat Occupied:**	Left
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	
Instrument Rating(s):	Airplane; Helicopter	**Second Pilot Present:**	Yes
Instructor Rating(s):	Helicopter	**Toxicology Performed:**	No
Medical Certification:	Class 2 With waivers/limitations	**Last FAA Medical Exam:**	July 1, 2005
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	January 1, 2006
Flight Time:	5714 hours (Total, all aircraft), 293 hours (Total, this make and model), 5132 hours (Pilot In Command, all aircraft), 155 hours (Last 90 days, all aircraft), 61 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

Student pilot Information

Certificate:	Private	**Age:**	36,Male
Airplane Rating(s):	None	**Seat Occupied:**	Right
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	
Instrument Rating(s):	None	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 2 Without waivers/limitations	**Last FAA Medical Exam:**	October 1, 2005
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	January 1, 2006
Flight Time:	111 hours (Total, all aircraft), 109 hours (Total, this make and model), 71 hours (Pilot In Command, all aircraft), 47 hours (Last 90 days, all aircraft), 18 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Schweizer	**Registration:**	N2096W
Model/Series:	269C	**Aircraft Category:**	Helicopter
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	S 1865
Landing Gear Type:	Skid	**Seats:**	2
Date/Type of Last Inspection:	May 1, 2006 Annual	**Certified Max Gross Wt.:**	2050 lbs
Time Since Last Inspection:	15 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	978 Hrs at time of accident	**Engine Manufacturer:**	Lycoming
ELT:	Installed, not activated	**Engine Model/Series:**	HIO-360-DIA
Registered Owner:	Aviation Specialties Unlimited	**Rated Power:**	190 Horsepower
Operator:		**Operating Certificate(s) Held:**	None
Operator Does Business As:		**Operator Designator Code:**	UABS

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	BOI,2871 ft msl	**Distance from Accident Site:**	2 Nautical Miles
Observation Time:	15:53 Local	**Direction from Accident Site:**	340°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	13 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	140°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.04 inches Hg	**Temperature/Dew Point:**	33°C / -1°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Boise, ID (BOI)	**Type of Flight Plan Filed:**	None
Destination:		**Type of Clearance:**	None
Departure Time:	14:15 Local	**Type of Airspace:**	

Airport Information

Airport:	Boise Air Terminal/Gowen Field BOI	**Runway Surface Type:**	
Airport Elevation:	2871 ft msl	**Runway Surface Condition:**	
Runway Used:		**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	Forced landing

Wreckage and Impact Information

Crew Injuries:	2 None	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 None	**Latitude, Longitude:**	43.532501,-116.229446

Administrative Information

Investigator In Charge (IIC):	Little, Thomas
Additional Participating Persons:	Nick Weber; Federal Aviation Administration; Boise, ID
Original Publish Date:	October 3, 2006
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=63697