Aviation Investigation Final Report

Location:	Santa Teresa, New Mexico	**Accident Number:**	DFW06TA127
Date & Time:	May 16, 2006, 10:10 Local	**Registration:**	N183AE
Aircraft:	Aerospatiale AS350-B3	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	1 Serious, 1 Minor
Flight Conducted Under:	Public aircraft		

Analysis

The purpose of the instructional flight was to conduct simulated emergency governor operations. The single-engine helicopter landed hard in a near level flight attitude in a slight tail low attitude. The landing gear skids collapsed on impact causing the lower vertical fin and tail rotor assembly to make contact with the ground, bucking the tailboom at the forward attaching points. The helicopter slid on it's fuselage 250 feet from the point of impact and came to rest in an upright position. The left pilot seat attenuated as designed but there was no evidence of attenuation on the right pilot seat. The crew performed an emergency engine shutdown and egressed unassisted. The wreckage of the helicopter was recovered to the facilities of the operator's secured facilities for further examination. The investigator examined the helicopter systems and tested the throttle twist grip for anomalies. The tests on the throttle twist grip simulated actions taken during the training flight. Several cycles of the governor from the "auto" mode to the "manual" mode for two minutes and back to the auto made for 3 minutes were performed to determine if a problem would occur that would restrict manual throttle operation. The examination determined after several cycles, that the solenoid that retracted to allow manual throttle manipulation would not fully retract and created a restriction due to heat generated during the activation. The helicopter seats were examined to determine if the any anomalies existed with the crash attenuating seats. The left front seat was documented as fully attenuating during the crash sequence and the right front seat had not attenuated. The seats were shipped for analysis to it's manufacturer's facilities in France for further testing. The examination and testing revealed that the seats met specifications and evidence on the right seat showed that the seat attenuation was initiating but did not appear to have sustained sufficient forces to fully stroke.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The flight instructor's improper supervision of the flight which resulted in a hard landing.

Findings

Occurrence #1: HARD LANDING
Phase of Operation: LANDING

Findings
1. EMERGENCY PROCEDURE - NOT FOLLOWED - PILOT IN COMMAND(CFI)
2. INADEQUATE TRAINING(EMERGENCY PROCEDURE(S)) - PILOT IN COMMAND(CFI)
3. (C) SUPERVISION - IMPROPER - PILOT IN COMMAND(CFI)

Factual Information

"THIS CASE WAS MODIFIED 1/15/2008."

On May 16, 2006, at 1010 mountain daylight time, a single-engine Aerospatiale AS350-B3 turbo-shaft helicopter, N183AE, registered to and operated by the U.S. Customs and Border Patrol Air Operations, was substantially damaged when it impacted the parallel taxiway to Runway 28 at the Dona Ana County Airport (K5T6) near Santa Teresa, New Mexico. The accident occurred during a differences training flight when the crew was performing emergency governor failure procedures. The certificated flight instructor received minor injuries and the commercial receiving instruction received serious injuries. Visual meteorological conditions prevailed, and a company flight plan was filed for the local training flight conducted as a Public Use Flight under 14 Code of Federal Regulations Part 91. The local flight departed El Paso International Airport (ELP), El Paso, Texas, approximately 0930.

A Customs and Border Patrol Safety Officer performed an on-scene examination of the wreckage. The Safety Officer reported the helicopter landed hard in a level flight attitude, in a slightly tail-low attitude. The landing gear skids collapsed on impact causing the lower vertical fin and tail rotor assembly to make contact with the ground, bucking the tail boom at the forward attaching points. The helicopter slid on it's fuselage 250 feet from the point of impact and came to rest in an upright position. The left pilot seat attenuated as designed but there was no evidence of attenuation on the right pilot seat. The crew performed an emergency engine shutdown and egressed unassisted.

A review of the instructor pilot's records revealed that the pilot had accrued a total of 2 hours in the AS350B3 variant, one hour of which was as an instructor. Eurocopter Service Letter No. 1702-71-05, dated April 12, 2006, addresses AS350B3 twist grip and FADEC configurations. This service letter specifically states for twist grip post MOD No. 073084 (accident aircraft configuration) that "training for total governor failure must be carried out with an experienced instructor." In addition, the instructor pilot stated in an interview that he told the pilots he was training, "I'm new to the aircraft too and we're learning this thing together, so if you see anything..."

Simulated governor failure training starts during stabilized flight by simulating a total engine governor failure by setting the "Auto/Manu" selector to "Manu". During training, regardless of the maneuvers carried out, it is always possible to de-activate the failure simulation by resetting the selector to "Auto" (stated in Flight Manual Training Supplement and Service Letter No. 1702-71-05). The automatic governor becomes immediately active provided that the twist grip has not been reduced beyond 30 degrees ("Idle" switch activated). The instructor pilot and pilot receiving instruction both stated during interviews that they did not attempt to reset the selector to "Auto."

The Service Letter further states, if the pilot does not feel sure of himself, he must not hesitate to return to "Auto" mode and then back to "Manu" mode from stabilized flight to perfect his pitch/grip coordination. Flight control in "Manu" mode must be fully mastered before carrying out a complete landing. For the landing, it is preferable to carry out a long direct final approach, to set power at rather less than that of level flight at Vy while monitoring the rotor speed (NR) and then slowly increase the grip as the speed drops until reaching hover flight. Allow the NR to decrease for the touch-down.

On March 2, 2004, Eurocopter Alert Telex No. 05.00.44 was published "to prevent the risk of losing the emergency governing function due to possible seizure of the twist grip after prolonged use of the emergency governing." This Alert Telex was addressed to maintenance personnel and crews and states in section 2.B.2 to "wait at least 15 minutes between two operations of the solenoid ("AUTO/MAN" governing mode selector set to "MAN").

The wreckage of the helicopter was recovered to the facilities of the U.S. Customs and Border Patrol Air Operations, near El Paso, Texas, for further examination. An investigator from Eurocopter, along with a Federal Aviation Administration Inspector and the US Customs and Border Patrol investigator examined the helicopter systems and tested the throttle twist grip for anomalies. The tests on the throttle twist grip simulated actions taken during the training flight. Several cycles of the governor from the auto mode to the manual mode for two minutes and back to the auto made for 3 minutes were performed to determine if a problem would occur that would restrict manual throttle operation. The examination determined after several cycles, that the solenoid that retracted to allow manual throttle manipulation would not fully retract and created a restriction due to heat generated during the activation.

The NTSB investigator in charge and parties to the investigation from SICMA seats and Eurocopter examined the helicopter seats to determine if the any anomalies existed with the crash attenuating seats. The left front seat was documented as fully attenuating during the crash sequence and the right front seat had not attenuated. The seats were shipped for analysis to SICMA in France for further testing. SICMA France, along with oversight from the BEA, determined that the seats met specifications and evidence on the right seat showed that the seat attenuation was initiating but did not appear to have sustained sufficient forces to fully stroke.

At 0955 MDT, weather reporting facility at Dona Ana County Airport reported winds from 100 degrees at 4 knots, gusting to 10 knots, visibility 10 statute miles, a broken cloud layer at 25,000 feet, temperature 68 degrees Fahrenheit, dew point 46 degrees Fahrenheit, and a barometric pressure of 30.25 inches of Mercury.

Flight instructor Information

Certificate:	Airline transport; Flight instructor	**Age:**	37,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	
Instrument Rating(s):	Airplane; Helicopter	**Second Pilot Present:**	Yes
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine; Helicopter	**Toxicology Performed:**	No
Medical Certification:	Class 2 Without waivers/limitations	**Last FAA Medical Exam:**	June 1, 2005
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	August 1, 2005
Flight Time:	3700 hours (Total, all aircraft), 2 hours (Total, this make and model), 2900 hours (Pilot In Command, all aircraft), 83 hours (Last 90 days, all aircraft), 30 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Pilot Information

Certificate:	Commercial	**Age:**	38,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Rear
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 1 Without waivers/limitations	**Last FAA Medical Exam:**	April 1, 2006
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	May 1, 2005
Flight Time:	4500 hours (Total, all aircraft), 1 hours (Total, this make and model), 3900 hours (Pilot In Command, all aircraft), 61 hours (Last 90 days, all aircraft), 45 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Aerospatiale	**Registration:**	N183AE
Model/Series:	AS350-B3	**Aircraft Category:**	Helicopter
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	3852
Landing Gear Type:	Skid	**Seats:**	6
Date/Type of Last Inspection:	January 1, 2006 100 hour	**Certified Max Gross Wt.:**	4961 lbs
Time Since Last Inspection:		**Engines:**	1 Turbo shaft
Airframe Total Time:	352 Hrs at time of accident	**Engine Manufacturer:**	Turbomeca
ELT:	Installed, not activated	**Engine Model/Series:**	ARRIEL 2B
Registered Owner:	US Department of Homeland Security	**Rated Power:**	847 Horsepower
Operator:		**Operating Certificate(s) Held:**	None
Operator Does Business As:	US Department of Homeland Security	**Operator Designator Code:**	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	5T6,4112 ft msl	**Distance from Accident Site:**	0 Nautical Miles
Observation Time:	09:55 Local	**Direction from Accident Site:**	0°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	Broken / 25000 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	4 knots / 10 knots	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	100°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.23 inches Hg	**Temperature/Dew Point:**	20°C / 8°C
Precipitation and Obscuration:			
Departure Point:	Santa Teresa, NM	**Type of Flight Plan Filed:**	Company VFR
Destination:	El Paso, TX (ELP)	**Type of Clearance:**	None
Departure Time:	09:30 Local	**Type of Airspace:**	

Airport Information

Airport:	Dona Ana County Airport 5T6	**Runway Surface Type:**	Asphalt
Airport Elevation:	4112 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	28	**IFR Approach:**	None
Runway Length/Width:	8500 ft / 100 ft	**VFR Approach/Landing:**	Simulated forced landing;Traffic pattern

Wreckage and Impact Information

Crew Injuries:	1 Serious, 1 Minor	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Serious, 1 Minor	**Latitude, Longitude:**	

Administrative Information

Investigator In Charge (IIC):	Gamble, William
Additional Participating Persons:	Robert O'Haver; FAA FSDO; Albuquerque, NM
Original Publish Date:	January 31, 2008
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=63689