



# National Transportation Safety Board Aviation Accident Final Report

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<b>Location:</b>	Duchesne, UT	<b>Accident Number:</b>	DEN05LA131
<b>Date &amp; Time:</b>	09/02/2005, 1240 MDT	<b>Registration:</b>	N220SH
<b>Aircraft:</b>	Aerospatiale SA315B	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>		<b>Injuries:</b>	1 Minor
<b>Flight Conducted Under:</b>	Part 133: Rotorcraft Ext. Load		

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## Analysis

During a helicopter external load operation, the pilot was attempting to lift a 1,500 pound drill rig that was attached to the end of a 75-foot long line at a terrain elevation of approximately 7,000 feet msl. As the drill was being lifted off the ground, the helicopter "suddenly [and] violently accelerated (pitched) down [and] left." The pilot attempted to correct the uncommanded movement by applying right aft cyclic; however, the helicopter began a "rapid spin to the left." A ground witness observed the helicopter complete 3 or 4, 360-degree rotations. The pilot then closed the throttle to the flight idle position, and the left rotation stopped. The helicopter entered a descent toward the terrain with approximately 10 knots of forward airspeed. Approximately 30-40 feet above ground level (agl), the pilot pulled the "remaining" collective to slow the descent and rotor RPM. The helicopter's main rotor blades contacted trees, and subsequently the helicopter came to rest on its right side. During the accident sequence, the pilot did not jettison the external load. The pilot reported the wind conditions as "calm" and the temperature 71 degrees Fahrenheit at the time of the accident. Examination of the airframe, systems, and a functional test of the engine revealed no anomalies. The reason for the loss of control was not determined.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: the loss of control during external load operations for undetermined reasons.

## Findings

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Occurrence #1: LOSS OF CONTROL - IN FLIGHT  
Phase of Operation: MANEUVERING

### Findings

1. (C) REASON FOR OCCURRENCE UNDETERMINED  
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Occurrence #2: IN FLIGHT COLLISION WITH OBJECT  
Phase of Operation: EMERGENCY DESCENT/LANDING

### Findings

2. REMEDIAL ACTION - ATTEMPTED - PILOT IN COMMAND  
3. OBJECT - TREE(S)

## Factual Information

On September 2, 2005, approximately 1240 mountain daylight time, an Aerospatiale SA315B, single-engine helicopter, N220SH, operated by Skydance Northwestern, Inc., Minden, Nevada, was substantially damaged when it impacted terrain following a loss of control during an external load operation approximately 11 miles southwest of the Duchesne Municipal Airport (U69), Duchesne, Utah. The airline transport pilot, sole occupant of the helicopter, was not injured. Visual meteorological conditions prevailed at the time of the accident. The flight was being conducted under Title 14 CFR Part 133 without a flight plan. The flight departed a remote landing zone near Duchesne, Utah, approximately 1200.

According to the pilot, he was attempting to lift a 1,500 pound drill rig that was attached to the end of a 75-foot long line at a terrain elevation of approximately 7,000 feet msl. As the drill was being lifted off the ground, the helicopter "suddenly [and] violently accelerated (pitched) down [and] left." The pilot attempted to correct the uncommanded movement by applying right aft cyclic; however, the helicopter began a "rapid spin to the left." A ground witness observed the helicopter complete 3 or 4, 360-degree rotations. The pilot then closed the throttle to the flight idle position, and the left rotation stopped. The helicopter entered a descent toward the terrain with approximately 10 knots of forward airspeed. Approximately 30-40 feet above ground level (agl), the pilot pulled the "remaining" collective to slow the descent and rotor RPM. The helicopter's main rotor blades contacted trees, and subsequently the helicopter came to rest on its right side. The pilot then shut off the fuel cut off, secured the electrical equipment, and exited the helicopter. During the accident sequence, the pilot did not jettison the external load. The pilot reported the wind conditions as "calm" and the temperature 71 degrees Fahrenheit at the time of the accident.

Examination by an Federal Aviation Administration (FAA) inspector at the accident site revealed the tail rotor driveshaft was intact, no particles were found on the tail rotor and transmission magnetic chip detectors, and no damage was noted to the tail rotor blades.

The airframe was examined under the supervision of a FAA inspector at the operator's headquarters in Minden, Nevada. Examination of the airframe revealed no anomalies with the main transmission, tail rotor drive, airframe fuel, and flight control systems. A fuel sample was obtained and tested with no evidence of contamination noted. In addition, the operator tested the fuel from the supplier at the time of the accident with no contamination or anomalies noted.

A review of the engine records revealed at the time of the accident, the airframe had accumulated 19,658.4 hours and the engine had accumulated 3,216.5 total hours and 318.6 hours since overhaul. On August 31, 2005, the helicopter underwent a 100-hour inspection, at a total airframe time of 19,637.4 hours.

On November 29, 2005, at the facilities of Heli-Support, Inc., Fort Collins, Colorado, under the supervision of the NTSB investigator-in-charge, the Turbomeca Artouste III B1 engine (serial number 1818) was examined and functionally tested. A borescope examination of the engine revealed deposits in and on all fuel injector wheel holes. The deposit material and source of the material was not determined. The injector wheel contamination was not removed prior to the functionally test of the engine. Upon completion of the visual and borescope examination, the

engine was functionally tested in accordance approved manufacturer's test procedures in a dynamometer equipped test cell. The functional test of the engine met or exceeded manufacturer's specifications, and no anomalies were noted with the engine.

The fuel pump and speed governor were removed from the engine and functionally tested. Flows were within serviceable limits for repair functional test. No anomalies were noted with the fuel pump and speed governor.

After the functional test of the engine, the engine was reborescoped. The borescope examination revealed deposits to a lesser degree, in and on the injector wheel holes.

### Pilot Information

<b>Certificate:</b>	Airline Transport	<b>Age:</b>	59, Male
<b>Airplane Rating(s):</b>	None	<b>Seat Occupied:</b>	Right
<b>Other Aircraft Rating(s):</b>	Helicopter	<b>Restraint Used:</b>	Seatbelt, Shoulder harness
<b>Instrument Rating(s):</b>	Helicopter	<b>Second Pilot Present:</b>	No
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	No
<b>Medical Certification:</b>	Class 2 With Waivers/Limitations	<b>Last Medical Exam:</b>	02/01/2005
<b>Occupational Pilot:</b>		<b>Last Flight Review or Equivalent:</b>	11/01/2004
<b>Flight Time:</b>	14500 hours (Total, all aircraft), 1200 hours (Total, this make and model), 14300 hours (Pilot In Command, all aircraft), 230 hours (Last 90 days, all aircraft), 80 hours (Last 30 days, all aircraft), 8 hours (Last 24 hours, all aircraft)		

### Aircraft and Owner/Operator Information

<b>Aircraft Manufacturer:</b>	Aerospatiale	<b>Registration:</b>	N220SH
<b>Model/Series:</b>	SA315B	<b>Aircraft Category:</b>	Helicopter
<b>Year of Manufacture:</b>		<b>Amateur Built:</b>	No
<b>Airworthiness Certificate:</b>	Normal	<b>Serial Number:</b>	2466
<b>Landing Gear Type:</b>	Skid	<b>Seats:</b>	1
<b>Date/Type of Last Inspection:</b>	08/01/2005, AAIP	<b>Certified Max Gross Wt.:</b>	4300 lbs
<b>Time Since Last Inspection:</b>	21 Hours	<b>Engines:</b>	1 Turbo Shaft
<b>Airframe Total Time:</b>	19658 Hours	<b>Engine Manufacturer:</b>	Turbomeca
<b>ELT:</b>	Installed, activated, did not aid in locating accident	<b>Engine Model/Series:</b>	Artouste III
<b>Registered Owner:</b>	Skydance Northwestern Inc.	<b>Rated Power:</b>	800 hp
<b>Operator:</b>	Skydance Northwestern Inc.	<b>Air Carrier Operating Certificate:</b>	

## Meteorological Information and Flight Plan

Observation Facility, Elevation:		Observation Time:	
Distance from Accident Site:		Condition of Light:	Day
Direction from Accident Site:		Conditions at Accident Site:	Visual Conditions
Lowest Cloud Condition:	Clear	Temperature/Dew Point:	22 ° C
Lowest Ceiling:	None	Visibility	10 Miles
Wind Speed/Gusts, Direction:	Calm, 140°	Visibility (RVR):	
Altimeter Setting:	29.92 inches Hg	Visibility (RVV):	
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Duschene, UT	Type of Flight Plan Filed:	None
Destination:	Duschene, UT	Type of Clearance:	Unknown
Departure Time:	1200 MDT	Type of Airspace:	

## Airport Information

Airport:	Duchesne Muninipal Airport (U69)	Runway Surface Type:	
Airport Elevation:	210 ft	Runway Surface Condition:	
Runway Used:	NA	IFR Approach:	Unknown
Runway Length/Width:		VFR Approach/Landing:	Unknown

## Wreckage and Impact Information

Crew Injuries:	1 Minor	Aircraft Damage:	Substantial
Passenger Injuries:	N/A	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 Minor		

## Administrative Information

Investigator In Charge (IIC):	Aaron M Sauer	Adopted Date:	07/31/2006
Additional Participating Persons:	James Gilchiest; Federal Aviation Administration; Salt Lake City, UT		
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 <a href="mailto:pubinq@ntsb.gov">pubinq@ntsb.gov</a> , or at 800-877-6799. Dockets released after this date are available at <a href="http://dms.nts.gov/pubdms/">http://dms.nts.gov/pubdms/</a> .		

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