



Aviation Investigation Final Report

Location:	Grand Canyon, Arizona	Accident Number:	LAX06CA003
Date & Time:	October 3, 2005, 17:10 Local	Registration:	N31MH
Aircraft:	Aerospatiale AS350B	Aircraft Damage:	Substantial
Defining Event:		Injuries:	7 None
Flight Conducted Under:	Part 135: Air taxi & commuter - Non-scheduled - Sightseeing		

Analysis

The helicopter encountered a ground resonance event following a hard landing in gusty wind conditions. The pilot reported that the winds were from the south at 18 knots with gusts to 36 knots. He hover-taxed to the helipad for landing following a sightseeing tour and had established the helicopter in a 3-foot hover in preparation for landing. A gust of wind disrupted the helicopter and brought it to a 6-foot hover. The pilot regained control and stabilized it back in a 3-foot hover. Another gust of wind "slammed" the helicopter onto the helipad and a ground resonance event began. The pilot lifted the helicopter back into the air upon noticing the increasing vibrations. After the vibrations dissipated, the pilot set it back onto the helipad.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: the pilot's failure to maintain control of the helicopter during landing in gusty wind conditions, which resulted in a hard landing and ground resonance.

Findings

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

Findings
1. WEATHER CONDITION - GUSTS

2. (C) AIRCRAFT CONTROL - NOT MAINTAINED - PILOT IN COMMAND
3. (C) GROUND RESONANCE - ENCOUNTERED - PILOT IN COMMAND

Factual Information

On October 3, 2005, at 1710 Pacific daylight time, an Aerospatiale AS350B, N31MH, encountered a ground resonance event following a hard landing at the Grand Canyon Airport (GCN), Grand Canyon, Arizona. The commercial rotorcraft pilot and six passengers were not injured; the helicopter sustained substantial damage. The helicopter was registered to, and operated by, Maverick Helicopters, Las Vegas, Nevada, as a sightseeing flight under the provisions of 14 CFR Part 135. The tour flight originated from GCN at 1647, and was terminating at the time of the accident. Visual meteorological conditions prevailed, and a company visual flight rules flight plan had been filed.

According to the pilot's written statement, he established the helicopter in a 3-foot hover and taxied to the helipad. As the helicopter neared the helipad, a "gust of wind lifted the aircraft into a 5- to 6-foot hover." The pilot regained control and reestablished the helicopter in a 3-foot hover and began lowering the collective to land. At 1.5 feet above the ground, another gust of wind "slammed" the helicopter onto the ground, impacting the terrain with the right front skid. A "violent vibration" began, and the pilot pulled the helicopter up in the air after realizing he was in a ground resonance situation. The vibrations dissipated, and the pilot set the helicopter down and shut off the engine.

The helicopter sustained substantial damage to its tail boom. Post accident examination of the landing skid system revealed that the spring-steel extensions were within limits and the dampers were in serviceable condition. The pilot did not report any anomalies with the helicopter prior to the event.

The pilot reported that the winds were from the south at 18 knots with gusts to 36 knots.

Pilot Information

Certificate:	Commercial; Flight instructor	Age:	22, Male
Airplane Rating(s):	None	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 Without waivers/limitations	Last FAA Medical Exam:	September 1, 2005
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	July 1, 2005
Flight Time:	1790 hours (Total, all aircraft), 240 hours (Total, this make and model), 240 hours (Last 90 days, all aircraft), 50 hours (Last 30 days, all aircraft), 4 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Aerospatiale	Registration:	N31MH
Model/Series:	AS350B	Aircraft Category:	Helicopter
Year of Manufacture:		Amateur Built:	
Airworthiness Certificate:	Normal	Serial Number:	2141
Landing Gear Type:	Skid	Seats:	7
Date/Type of Last Inspection:	September 1, 2005 100 hour	Certified Max Gross Wt.:	4961 lbs
Time Since Last Inspection:	92.3 Hrs	Engines:	1 Turbo shaft
Airframe Total Time:	8933 Hrs at time of accident	Engine Manufacturer:	Turbomeca
ELT:	Installed, not activated	Engine Model/Series:	Arial 1D1
Registered Owner:	Maverick Helicopters Inc.	Rated Power:	700 Horsepower
Operator:		Operating Certificate(s) Held:	On-demand air taxi (135)
Operator Does Business As:		Operator Designator Code:	M7KA

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
Observation Facility, Elevation:		Distance from Accident Site:	
Observation Time:		Direction from Accident Site:	
Lowest Cloud Condition:	Clear	Visibility	10 miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	18 knots / 36 knots	Turbulence Type Forecast/Actual:	/
Wind Direction:	180°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30.02 inches Hg	Temperature/Dew Point:	23°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Grand Canyon, AZ (GCN)	Type of Flight Plan Filed:	Company VFR
Destination:		Type of Clearance:	VFR
Departure Time:	16:47 Local	Type of Airspace:	

Airport Information

Airport:	Grand Canyon National Park GCN	Runway Surface Type:	
Airport Elevation:	6609 ft msl	Runway Surface Condition:	
Runway Used:		IFR Approach:	None
Runway Length/Width:		VFR Approach/Landing:	Full stop

Wreckage and Impact Information

Crew Injuries:	1 None	Aircraft Damage:	Substantial
Passenger Injuries:	6 None	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	7 None	Latitude, Longitude:	33.62931,-112.090744(est)

Administrative Information

Investigator In Charge (IIC):	Charnon, Nicole
Additional Participating Persons:	Nick Harrington; Federal Aviation Administration; Las Vegas, NV
Original Publish Date:	February 28, 2006
Last Revision Date:	
Investigation Class:	Class
Note:	This accident report documents the factual circumstances of this accident as described to the NTSB.
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=62602

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, “accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person” (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available [here](#).