Aviation Investigation Final Report

Location:	Riverside, California	**Accident Number:**	LAX03TA204
Date & Time:	June 13, 2003, 12:45 Local	**Registration:**	N6087C
Aircraft:	Eurocopter France AS 350 B2	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	2 None
Flight Conducted Under:	Public aircraft		

Analysis

The public use operator of the helicopter reported that the purpose of the flight was for the flying pilot to receive an annual proficiency check. During a simulated "stuck" anti-torque pedal emergency landing procedure, the flying pilot attempted to land the helicopter on a hard surfaced runway while the helicopter still had significant yaw. The helicopter touched down twice, and landed hard on the second touchdown, resulting in structural damage to the helicopter's fuselage and drive train components. Both pilots held flight instructor and airline transport certificates. The check pilot did not intercede or apply remedial action while the flying pilot was attempting to land with the simulated stuck pedal.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The flying pilot's failure to align the helicopter during a simulated emergency landing, which resulted in a hard landing and structural damage to the helicopter. A factor associated with the accident was the check pilot's failure to initiate remedial action.

Findings

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

Findings
1. EMERGENCY PROCEDURE - SIMULATED - CHECK PILOT

2. (C) PROPER ALIGNMENT - NOT ATTAINED - PILOT IN COMMAND
3. (F) REMEDIAL ACTION - NOT PERFORMED - CHECK PILOT
4. TERRAIN CONDITION - RUNWAY

Factual Information

HISTORY OF FLIGHT

On June 13, 2003, about 1245 Pacific daylight time, a American Eurocopter AS 350 B2, N6087C, landed hard while practicing simulated emergency procedures at March ARB (RIV), Riverside, California. U.S. Customs Service (USCS) was operating the helicopter under the provisions of 14 CFR Part 91. The two airline transport pilots were not injured; the helicopter sustained substantial damage. The public use, local, instructional flight departed RIV about 1205. Day visual meteorological conditions prevailed, and no flight plan had been filed. The primary wreckage was at 33 degrees 52 minutes north latitude and 117 degrees 15 minutes west longitude.

While executing the emergency procedures evaluation portion of a USCS annual flight check. The check pilot (CP) simulated an Anti-Torque Malfunction emergency by simulating a stuck right pedal as the pilot was departing runway 30 at RIV. The flying pilot (FP) continued to fly a normal traffic pattern to land on runway 30, during this time the FP and IP discussed the emergency procedures check list for a stuck pedal by memory. The FP slowed the aircraft below 70 knots. The FP turned to final for runway 30, as he began a normal to shallow approach to make a running landing, and the nose of the helicopter was allowed to yaw to the right. When the helicopter approached the runway and the airspeed decreased below effective translational lift, the aircraft's nose continued to yaw further to the right. The FP attempted to counteract the yaw by increasing collective pitch. The FP did not completely correct the yaw of the aircraft before the right skid touched down on the runway. The FP picked up the helicopter to straighten the landing. The helicopter again touched down on the right skid, followed by the left skid impacting the ground "firmly". Both pilots reported they felt a "thud" throughout the helicopter. While on the runway, with the helicopter running the CP exited the helicopter and performed a visual inspection of the aircraft, during which he observed wrinkles in the tail boom. The CP got back into the helicopter and informed the FP that they needed to return to the USCS ramp. The helicopter was flown to the USCS facility located about .7 miles from the accident location.

The operator submitted a Pilot/Operator Aircraft Accident Report (NTSB Form 6120.1/2). The pilot stated that the aircraft had no mechanical failures or malfunctions during the flight.

PERSONNEL INFORMATION

Check Pilot (CP):
A review of Federal Aviation Administration (FAA) airman records revealed that the check pilot (CP) held an airline transport pilot certificate with ratings for airplane single-engine land, multi-engine land, rotorcraft-helicopter and glider. The pilot held a certified flight instructor (CFI)

certificate with ratings for airplane single-engine land, multi-engine land, rotorcraft-helicopter, and instrument airplane and helicopter.

The pilot held a first-class medical certificate that was issued on June 17, 2003. It had the limitations that the pilot must wear corrective lenses.

The CP reported a total flight time of 14,250 hours. He logged 40 hours in the last 90 days, and 2 in the last 30 days. He had en estimated 1,200 hours in this make and model. He completed a biennial flight review on September 25, 2002.

Flying Pilot (FP):
A review of Federal Aviation Administration (FAA) airman records revealed that the flying pilot (FP) held an airline transport pilot certificate with ratings for airplane single-engine land, multi-engine land, rotorcraft-helicopter, and instrument helicopter. The pilot held a certified flight instructor (CFI) certificate with ratings for rotorcraft-helicopter.

The pilot held a second-class medical certificate that was issued on December 02, 2002. It had It had no limitations or waivers.

The flying pilot reported a total flight time of 6,000 hours. He logged 69 hours in the last 90 days, and 25 in the last 30 days. He had en estimated 585 hours in this make and model. He completed a biennial flight review in April 2003.

AIRCRAFT INFORMATION

The helicopter was an American Eurocopter AS 350 B2, serial number 2677. The operator reported the helicopter's total airframe time of 3,752.6 hours at the last 100-hour/annual inspection. The annual inspection was completed on June 10, 2003. At the time of the accident the helicopter had 4.2 flight hours since the last inspection.

The helicopter engine was a Turbomecca Arriel 1D1 engine, serial number 09274. Total time on the engine at the last 100-hour/annual inspection was 3,125.1 hours.

Examination of the maintenance and flight department records revealed no unresolved maintenance discrepancies against the helicopter prior to departure.

The accident helicopter had the battery relocated from the original installation of the right side cargo compartment to midway down the tail boom. The relocation was completed per the Supplemental Type Certificate #SH117NW authorized by the Federal Aviation Administration.

METEOROLOGICAL INFORMATION

The closest official weather observation station was March Air Reserve Base, Riverside, California (RIV). The elevation of the weather observation station was 1,538 feet msl. An

aviation routine weather report (METAR) for RIV was issued at 1255 PDT. It stated: winds from 280 degrees at 5 knots; visibility 4 miles haze; temperature 25/77 degrees Celsius/Fahrenheit; dew point 12/54 degrees Celsius/Fahrenheit; altimeter 29.93 inHg.

AIRPORT INFORMATION

The Airport/ Facility Directory, Southwest U. S., indicated that RIV runway 30 was 3,145 feet long and 100 feet wide. The runway surface was composed of asphalt.

WRECKAGE AND IMPACT INFORMATION

The damage to the helicopter was located at station 199.68 and included; the tail boom was wrinkled, the luggage compartment cone was wrinkled, the tail rotor drive shaft, and tail rotor Thomas couplings were damaged. The landing gear rod end pin was sheared, and the door posts were cracked.

Check pilot Information

Certificate:	Airline transport; Flight instructor	**Age:**	49,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	Glider; Helicopter	**Restraint Used:**	
Instrument Rating(s):	Airplane; Helicopter	**Second Pilot Present:**	
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine; Helicopter; Instrument airplane; Instrument helicopter	**Toxicology Performed:**	No
Medical Certification:		**Last FAA Medical Exam:**	
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	September 25, 2002
Flight Time:	14250 hours (Total, all aircraft), 1200 hours (Total, this make and model), 10000 hours (Pilot In Command, all aircraft), 40 hours (Last 90 days, all aircraft), 2 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

Pilot Information

Certificate:	Airline transport	**Age:**	45,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	
Instrument Rating(s):	Airplane; Helicopter	**Second Pilot Present:**	
Instructor Rating(s):	Helicopter	**Toxicology Performed:**	No
Medical Certification:	Class 2 Valid Medical--no waivers/lim.	**Last FAA Medical Exam:**	November 10, 2003
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	April 15, 2003
Flight Time:	6000 hours (Total, all aircraft), 585 hours (Total, this make and model), 5000 hours (Pilot In Command, all aircraft), 69 hours (Last 90 days, all aircraft), 25 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Eurocopter France	**Registration:**	N6087C
Model/Series:	AS 350 B2	**Aircraft Category:**	Helicopter
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	2677
Landing Gear Type:	High skid	**Seats:**	5
Date/Type of Last Inspection:	June 10, 2003 100 hour	**Certified Max Gross Wt.:**	4961 lbs
Time Since Last Inspection:	4.2 Hrs	**Engines:**	1 Turbo shaft
Airframe Total Time:	3752.6 Hrs at time of accident	**Engine Manufacturer:**	Turbomeca
ELT:	Installed, not activated	**Engine Model/Series:**	Arriel 1D1
Registered Owner:	U S CUSTOMS AIR BRANCH	**Rated Power:**	732 Horsepower
Operator:		**Operating Certificate(s) Held:**	None
Operator Does Business As:		**Operator Designator Code:**	U7SM

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	RIV,1515 ft msl	**Distance from Accident Site:**	
Observation Time:	12:55 Local	**Direction from Accident Site:**	
Lowest Cloud Condition:	Few / 0 ft AGL	**Visibility**	4 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	5 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	280°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.93 inches Hg	**Temperature/Dew Point:**	25°C / 12°C
Precipitation and Obscuration:	N/A - None - Haze		
Departure Point:	Riverside, CA (RIV)	**Type of Flight Plan Filed:**	None
Destination:		**Type of Clearance:**	None
Departure Time:	12:05 Local	**Type of Airspace:**	Class D

Airport Information

Airport:	MARCH AFB RIV	**Runway Surface Type:**	Asphalt
Airport Elevation:	1538 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	30	**IFR Approach:**	None
Runway Length/Width:	3145 ft / 100 ft	**VFR Approach/Landing:**	Traffic pattern

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:**	33.880554,-117.259445

Administrative Information

Investigator In Charge (IIC):	Jones, Patrick
Additional Participating Persons:	BRAD HOWARD; Federal Aviation Administration; Riverside, CA
Original Publish Date:	December 28, 2004
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=57278