



National Transportation Safety Board Aviation Accident Final Report

Location:	Boulder City, NV	Accident Number:	WPR14LA313A
Date & Time:	07/25/2014, 1646 PDT	Registration:	N154GC
Aircraft:	EUROCOPTER EC 130 B4	Aircraft Damage:	Substantial
Defining Event:	Ground collision	Injuries:	7 None
Flight Conducted Under:	Part 135: Air Taxi & Commuter - Non-scheduled - Sightseeing		

Analysis

The commercial helicopter pilot was operating on his first day of revenue service for the aerial tour company and was returning to the nontowered airport at the completion of a tour with six passengers. The pilot complied with the published arrival procedures, including flying the prescribed route and making the appropriate radio position callouts on the airport's common traffic advisory frequency (CTAF). Concurrent with the helicopter's arrival, the captain and first officer of an aerial tour airplane were beginning the taxi-out for departure of the positioning flight. The airport arrival procedures, layout, and wind conditions resulted in the two aircraft having to use the same portion of taxiway Delta, in the same direction, for their respective operations.

The helicopter pilot reported that he first saw the airplane when the helicopter was turning westbound and descending over Delta; at that time, the airplane was taxiing southbound on the ramp toward Delta. The helicopter pilot announced his location and intentions and continued descending along Delta. When the airplane reached Delta, the first officer announced on the CTAF that the airplane was planning to proceed westbound on Delta. The captain reported that he looked but did not see any helicopters and that he then proceeded to turn westbound onto Delta, which placed the airplane directly into and under the helicopter's flightpath and prompted the helicopter pilot to radio that he was "right above" the airplane and repeat his landing intentions. The helicopter pilot continued the descent based on his hearing a "double-click" on the CTAF, which he interpreted as the airplane flight crew's acknowledgement that they saw and would avoid the helicopter. Shortly thereafter, the helicopter collided with the airplane; damage patterns indicated that the two aircraft were aligned in nearly the same direction (westbound) at the time of impact.

Because the helicopter was approaching from the airplane's left, along taxiway Delta, and was close in, it should have been readily visually detectable by the captain. Given that the first officer was aware of the inbound helicopter and should have been aware of its location and intentions based on the radio calls, the airplane's flight crew should have recognized the high potential for conflict and operated the airplane in a manner to ensure that a collision would not

occur. In addition, the helicopter, as the landing aircraft, had the right of way over the departing airplane. The simplest and most effective method to prevent any conflict would have been for the airplane flight crew to stop on the ramp and not proceed onto taxiway Delta until the helicopter was positively determined to no longer pose a collision threat. However, there was no evidence that the airplane stopped before it turned from the ramp onto taxiway Delta. The evidence indicated that the airplane taxied out just ahead of and below the descending but faster moving helicopter, which significantly reduced the helicopter pilot's ability to avoid the airplane.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

The airplane flight crew's failure to exercise the necessary vigilance and precautions and yield the right of way to the landing helicopter, which resulted in the airplane colliding with the helicopter. Contributing to the accident was the helicopter pilot's decision to continue his descent without positively determining that the airplane did not pose a collision hazard.

Findings

Personnel issues	
	Monitoring other aircraft - Pilot of other aircraft (Cause)
	Decision making/judgment - Pilot (Factor)

Factual Information

HISTORY OF FLIGHT

On July 25, 2014, about 1646 Pacific daylight time, a landing Eurocopter/Airbus EC-130 helicopter, N154GC, and a taxiing DeHavilland DHC-6 airplane, N190GC, collided at Boulder City airport (BVU) Boulder City, Nevada. Neither the two pilots on board the airplane, nor the pilot and six passengers aboard the helicopter, were injured. The helicopter, operated by Papillon Airways Inc. (dba Papillon Grand Canyon Helicopters dba Grand Canyon Helicopters) as an aerial sightseeing flight, sustained substantial damage. That flight was being conducted under the provisions of Title 14 Code of Federal Regulations Part 135. The airplane, operated by Grand Canyon Airlines, was beginning a repositioning flight, and was being operated under the provisions of Title 14 Code of Federal Regulations Part 91. Both Papillon and Grand Canyon Airlines (GCA) are part of the same parent company, Papillon Airways. Day visual meteorological conditions prevailed.

According to the helicopter pilot, he was inbound from the south, and planned to land on the airport location designated as "Spot 2," which was a dedicated helicopter arrival and departure location. He followed the company-designated arrival procedure, in which the helicopter flew a descending pattern first north along the centerline of taxiway A (also referred to as "alpha"), and then west along the centerline of taxiway D (also referred to as delta) to Spot 2. Spot 2 was a 50 foot painted square situated on the airport ramp. Taxiway Delta was 40 feet wide, was oriented approximately east-west, and comprised the southern perimeter of the previously-cited ramp. The center of Spot 2 was located about 50 feet north of the centerline of taxiway Delta. Since BVU was not equipped with an operating air traffic control tower, the pilot communicated his positions and intentions via radio transmissions on the BVU common traffic advisory frequency (CTAF).

The helicopter pilot first saw the airplane when the helicopter was making the left turn from north to west near the junction of taxiways Alpha and Delta. At that time, the airplane was moving south, towards taxiway Delta, along a taxi line just east of Spot 1, on ramp about 600 feet east of Spot 2. The airplane crew announced their intentions on CTAF to taxi to runway 15 via taxiway Delta. The helicopter pilot reported that the last time that he saw the airplane prior to the accident was as the helicopter overflew the intersection of taxiway Delta and the taxi line just east of Spot 1. At that time, the airplane was turning westbound onto taxiway Delta. The helicopter pilot realized the potential for conflict, since the two aircraft were now both traveling westbound along taxiway Delta. The helicopter pilot stated that he "immediately" queried on CTAF whether the airplane crew had him in sight. The helicopter pilot heard a "double click" on the CTAF frequency, which he interpreted as acknowledgement by the airplane crew that they had him in sight. Based on this information, the helicopter pilot was convinced that the airplane was behind him, and that its flight crew had him in sight.

The helicopter pilot therefore continued his descent along the centerline of taxiway Delta towards Spot 2. About 8 to 10 seconds later, as the helicopter came almost abeam of Spot 2, the pilot began a right pedal turn to traverse to and set down on Spot 2. At the commencement of that pedal turn, the pilot simultaneously spotted the wings and nose of the airplane through his

chin windows, and felt an " impact." He stopped the turn and descent, transitioned to the ramp, descended, and landed on Spot 2.

The flight crew of the airplane was unaware that there had been a collision, and they continued with their taxi-out and departure from BVU. Shortly after departure, the airplane was recalled to BVU by company personnel, after the company personnel learned of the collision. The airplane was equipped with a cockpit voice recorder (CVR). The device was obtained by the NTSB, and sent to the NTSB recorders laboratory in Washington DC for readout.

PERSONNEL INFORMATION

Helicopter Pilot

Papillon records indicated that the pilot held a commercial pilot certificate with a helicopter instrument and instructor ratings. He had approximately 1,102 total hours of flight experience, all of which was in helicopters, and which included approximately 9 hours in the accident helicopter make and model. His most recent flight review was completed on July 22, 2014, and his most recent FAA second-class medical certificate was issued on December 2, 2013.

The helicopter pilot had recently been hired by Papillon, and the accident occurred on his first day flying in revenue service for the operator. The helicopter pilot did not recall whether he observed the airplane stop on the ramp prior to its turn onto taxiway Delta.

Airplane Captain

The captain of the airplane was an 11 year employee of the operator, and was also an instructor pilot. The captain had been on duty for 8 of the 9 days before the accident. He began his duty day at 0507 that morning, and the collision occurred during his sixth flight of the day. He was off duty the day prior to the accident. The day prior to that, he was on duty from about 0645 to 1845, and flew 7 trips, with a total of 3.5 hours of flight time.

In his written account of the event, the Captain stated that the crew completed the before takeoff checklist prior to taxiing, which was "a procedure designed to ensure maximum situational awareness, so each pilot can listen for pertinent radio calls and look outside the aircraft for conflicting aircraft" during taxi. Nowhere in his written statement did the Captain report that he stopped the airplane on the ramp prior to turning onto taxiway Delta. Except for his description of the closest proximity of the helicopter and airplane, the Captain's report did not include any information regarding his awareness of the helicopter.

Airplane First Officer

According to Grand Canyon Airlines, the First Officer was on his second day as a pilot for the airline.

Except for his description of the closest proximity of the helicopter and airplane, the First Officer's written report did not include any information regarding his awareness of the helicopter. His report did not state whether the airplane did or did not stop on the ramp prior to turning onto taxiway Delta.

AIRCRAFT INFORMATION

Helicopter

The single-main-rotor helicopter was manufactured in 2010, and was powered by a single turboshaft engine. It was used for aerial tours, and was configured to seat seven passengers. It was flown by a single pilot, who operated from the left front seat.

Airplane

The high-wing, twin-turboprop airplane was manufactured in 1970. It was used for aerial tours, and was configured to seat 17 passengers. It was operated by a two-person crew.

METEOROLOGICAL INFORMATION

The 1646 BVU automated weather observation included winds from 160 degrees at 15 knots, gusts to 23 knots, visibility 10 miles, clear skies, temperature 40 degrees C, dew point 11 degrees C, and an altimeter setting of 29.84 inches of mercury.

COMMUNICATIONS

BVU was equipped with a dedicated CTAF for radio communications use by arriving and departing aircraft, and the CTAF communications were recorded. Radio transmissions from both the helicopter (radio call sign "Papillon 31") and the airplane (radio call sign "Canyon View 90") were captured by the CTAF system, and reviewed by investigators.

The helicopter pilot first reported on the CTAF at 1644:10, and announced that he was "south of the [electrical power] substation," a geographic reference landmark, at an altitude of 2,800 feet above mean sea level, and flying towards "the ponds," another geographic reference landmark that was situated just south of the airport. At 1644:55, the airplane crew first reported on the CTAF, announcing that it was taxiing from the "east apron" (a BVU ramp area) to runway 27 via taxiway Delta. That runway selection and taxi route required the airplane to first taxi south on the ramp, and then east on taxiway Delta.

At 1645:08, the helicopter pilot announced that he was "over the Ponds, coming over [taxiway] Alpha for a westbound [taxiway] Delta approach." At 1645:39, the airplane crew announced that it was "taxiing [taxiway] Delta [taxiway] Bravo for runway one five." That new runway selection required that the airplane taxi westbound on taxiway Delta, instead of eastbound as originally planned. According to the airplane captain's written statement, that radio call was made as the airplane was turning right (westbound) onto taxiway Delta. The captain also noted that at that time, he "looked out the left window," but did not "see any in or out bound helicopters."

At 1645:45 the helicopter pilot radioed "Canyon View Papillon 31 right above you for Spot Two." The helicopter pilot's vocal cadence in that communication was different than that of his previous transmissions, and the transmission was accompanied by noticeable breathing, which was not evident in his prior transmissions.

The next communication from either aircraft was at 1647:51, when the airplane crew announced that it was "taking runway one five" for departure.

According to information provided by the operator, the first officer was handling the radio communications, and the captain was taxiing the airplane. The first officer was aware of the inbound helicopter, but the captain was not specifically aware of that helicopter.

AIRPORT INFORMATION

BVU elevation was 2,200 feet. BVU was equipped with two runways, 9/27 and 15/33. The runways intersected at about the midpoint of 9/27 and the two-thirds point of runway 15. The ramp area was oriented east-west, and situated about 750 feet north of runway 9/27. Taxiway Delta was the paint-demarcated southern boundary of the ramp area. Taxiway Alpha was oriented north-south, and connected the threshold end of runway 27 with taxiway Delta and the ramp area. Taxiway Bravo was parallel to, and on the east-northeast side of runway 15/33.

The airport maintained a dedicated website to provide relevant airport information, including a two-page document of helicopter arrival and departure procedures. That document contained both text and pictorial descriptions of those procedures, and also depicted the airplane runway traffic patterns. The descriptions included the geographic landmarks referenced by the helicopter pilot.

The FAA airport/facilities directory entry for BVU contained a note that stated "LARGE NUMBER OF GRAND CANYON TOUR ACFT OPERATIONS IN VICINITY. HELICOPTERS CROSS ACTIVE RYS AND TWYS." (emphasis original)

FLIGHT RECORDERS

The CVR from the airplane was successfully read out at the NTSB recorders laboratory in Washington DC. The recorded intra- and extra-cockpit communications were essentially congruent with the pilots' accounts of events that were provided to the NTSB at the beginning of the investigation.

WRECKAGE AND IMPACT INFORMATION

Examination of the two aircraft revealed that the most significant damage occurred where the inboard trailing edge of the helicopter's right horizontal stabilizer contacted the leading edge of the airplane's vertical stabilizer at about the vertical stabilizer's two-thirds span point. Additional damage was observed on the underside end of at least one of the helicopter main rotor blades, and the top of the airplane's vertical stabilizer.

ADDITIONAL INFORMATION

Aircraft Right of Way Information

Paragraph 91.113 of the Federal Aviation Regulations (FAR) provides some guidance on aircraft right of way rules. Subparagraph 'b' stated that "vigilance shall be maintained by each person operating an aircraft so as to see and avoid other aircraft," and that the "pilot shall give way to

that aircraft and may not pass over, under, or ahead of it unless well clear." Subparagraph 'g' stated that "Aircraft, while on final approach to land or while landing, have the right-of-way over other aircraft in flight or operating on the surface."

The FAA Pilot's Handbook of Aeronautical Knowledge (FAA-H-8083-25) reiterated the essence of the applicable FAR, and augmented it with the statement "Even if entitled to the right-of-way, a pilot should yield if another aircraft seems too close."

Three days after the accident, GCA's Flight Operations department published and distributed "Read and Initial File" (RIF) 2014-02 to its pilots. The RIF "designated taxiway Delta between Alpha and Bravo as a Hot Spot," and stated that "Regardless of direction traveling on taxiway Delta, extra vigilance is required." In addition, the RIF explicitly required that pilots of airplanes departing the ramp are to come to a "complete stop," report their position, and scan for traffic prior to taxiing onto taxiway Delta.

Cockpit Visibility

According to a representative of GCA, the external visibility from the cockpit of the DHC-6 was somewhat limited, and could have impeded the captain's ability to visually detect the inbound helicopter. Subsequent to the accident, the two operators began a program to familiarize the helicopter and airplane pilots' with each other's aircraft and procedures, with a focus on cockpit visibility as one area of emphasis.

Operator Communications Regarding Accident

In January 2016, the Papillon Airways "Chief Operating Officer/Director of Operations" provided a 4 page document which presented an accident summary, numerous operator-implemented safety improvement steps, and a "root-cause analysis" regarding the accident. The document bore "Papillon Airways, Inc" on its first page, but was otherwise unidentified and unattributed. It was not dated. In response to an NTSB query, to the Papillon COO/DO, the document was reported to be the result of an investigation by Papillon "President and CEO...with the Papillon and GCA senior management team."

The "root cause analysis" segment of the document posted the following as relevant facts:

- a) The airplane First Officer saw an "inbound helicopter" after Papillon 31 made its CTAF call
- b) The airplane Captain did not hear the radio call or see a helicopter inbound
- c) The airplane had taxied onto taxiway Delta prior to making its CTAF announcement that it was doing so

Item b) was not substantiated or otherwise known to the NTSB except as stated in this Papillon report, and efforts to independently verify that statement were unsuccessful.

History of Flight

Landing	Ground collision (Defining event)
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Pilot Information

Certificate:	Flight Instructor; Commercial	Age:	30, Male
Airplane Rating(s):	None	Seat Occupied:	Left
Other Aircraft Rating(s):	Helicopter	Restraint Used:	3-point
Instrument Rating(s):	Helicopter	Second Pilot Present:	No
Instructor Rating(s):	Helicopter	Toxicology Performed:	No
Medical Certification:	Class 2 With Waivers/Limitations	Last Medical Exam:	12/02/2013
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	07/22/2014
Flight Time:	1102 hours (Total, all aircraft), 9 hours (Total, this make and model), 1019 hours (Pilot In Command, all aircraft), 9 hours (Last 90 days, all aircraft), 9 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Manufacturer:	EUROCOPTER	Registration:	N154GC
Model/Series:	EC 130 B4	Aircraft Category:	Helicopter
Year of Manufacture:	2010	Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	7077
Landing Gear Type:	Skid	Seats:	8
Date/Type of Last Inspection:	07/25/2014, 100 Hour	Certified Max Gross Wt.:	5350 lbs
Time Since Last Inspection:	3 Hours	Engines:	1 Turbo Shaft
Airframe Total Time:	5057 Hours	Engine Manufacturer:	Turbomeca
ELT:	C126 installed, not activated	Engine Model/Series:	Arriel 2B1
Registered Owner:	PAPILLON AIRWAYS INC	Rated Power:	730 hp
Operator:	PAPILLON AIRWAYS INC	Air Carrier Operating Certificate:	Agricultural Aircraft (137); Rotorcraft External Load (133); On-demand Air Taxi (135)
Operator Does Business As:	Grand Canyon Helicopters	Operator Designator Code:	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	HND, 2491 ft msl	Observation Time:	1656 PDT
Distance from Accident Site:	13 Nautical Miles	Direction from Accident Site:	270°
Lowest Cloud Condition:	Clear	Temperature/Dew Point:	40° C / 9° C
Lowest Ceiling:	None	Visibility	10 Miles
Wind Speed/Gusts, Direction:	15 knots/ 19 knots, 240°	Visibility (RVR):	
Altimeter Setting:	29.86 inches Hg	Visibility (RVV):	
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Boulder City, NV (BVU)	Type of Flight Plan Filed:	Company VFR
Destination:	Boulder City, NV (BVU)	Type of Clearance:	None
Departure Time:	PDT	Type of Airspace:	Class G

Airport Information

Airport:	Boulder City (BVU)	Runway Surface Type:	N/A
Airport Elevation:	2200 ft	Runway Surface Condition:	Dry
Runway Used:	N/A	IFR Approach:	None
Runway Length/Width:		VFR Approach/Landing:	Traffic Pattern

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:	35.947500, -114.855000 (est)

Administrative Information

Investigator In Charge (IIC):	Michael C Huhn	Adopted Date:	09/14/2016
Additional Participating Persons:	John Waugh; FAA FSDO; Las Vegas, NV John Becker; Papillon Airways; Las Vegas, NV Burl Boyd; Papillon Airways; Las Vegas, NV		
Publish Date:	01/17/2017		
Note:	The NTSB did not travel to the scene of this accident.		
Investigation Docket:	http://dms.nts.gov/pubdms/search/dockList.cfm?mKey=89741		

The National Transportation Safety Board (NTSB), established in 1967, is an independent federal agency mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report.