National Transportation Safety Board
Aviation Accident Final Report

Location:	Altadena, California	**Accident Number:**	WPR13GA044
Date & Time:	November 17, 2012, 15:58 Local	**Registration:**	N911FA
Aircraft:	Bell OH-58	**Aircraft Damage:**	Substantial
Defining Event:	Low altitude operation/event	**Injuries:**	3 Minor
Flight Conducted Under:	Public aircraft		

Analysis

The commercial pilot had conducted traffic evaluation flights earlier in the day. After conferring with her lieutenant, she decided to attempt another flight with the understanding that she would return if the weather was not good. She departed, and after a few minutes, returned to the heliport to land due to deteriorating weather. While the helicopter was airborne, another pilot had moved a helicopter out of the hangar and parked outside of the marked parking pad area designated as "Pad 1." He later stated that he parked outside the pad because of drainage issues and that he was not on the radios because he would be off the ground in a couple of minutes and he did not believe there would be a conflict. The pilot had started the engine and begun the start-up sequence.

Upon return to the heliport, the pilot of the landing helicopter scouted the landing area to make sure it was clear. The pilot observed the other helicopter parked near the parking pad, but due to rain on the windshield, she was not able to determine whether the helicopter was inside or outside of the marked box or if the main rotor blades were turning. The landing pilot stated that, as a result of the rain on her windscreen and side windows, she was looking straight ahead and using the chin window and her periphery to land inside the box. She radioed her intention to land and received no response. She then made the approach to the main pad, assuming that the other helicopter was inside the box for Pad 1, and then hover-taxied toward the adjacent parking pad (Pad 2). She was focused on her landing pad area, and as she lowered the collective to land on Pad 2, the pilot did not confirm adequate clearance, and the main rotor blades of the landing helicopter contacted the main rotor blades of the parked helicopter.

At the time of the accident, there was no established monitored UNICOM frequency at the heliport, and there were no procedures to alert ground personnel that a helicopter was arriving to the heliport other than by ground personnel "hearing" it approach. The pilot in the parked helicopter had not turned on his radios, and the pilots were not in communication with each other at the time of the accident. As a result of the accident, the air division established monitored UNICOM and radio procedures for arrival and departure of helicopters at the heliport.

Probable Cause and Findings

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

The landing pilot's failure to maintain clearance from a parked helicopter and the other pilot's failure to park the helicopter inside of a marked parking pad. Contributing to the accident was the landing pilot's obscured visibility due to moisture on the windscreen.

Findings

Personnel issues	Monitoring other aircraft - Pilot
Environmental issues	Aircraft - Contributed to outcome
Personnel issues	Incorrect action selection - Pilot of other aircraft
Environmental issues	Visibility - Effect on personnel
Environmental issues	Airport communication - Not specified

Factual Information

HISTORY OF FLIGHT

On November 17, 2012, at 1558 Pacific standard time, a Pasadena Police Department (PD) helicopter struck another stationary Pasadena PD helicopter while maneuvering to park at the Pasadena Police Benedict Heliport, Altadena, California. N911FA, a Bell OH-58, was attempting to park on Pad 2 at the Pasadena PD heliport, and N96BM, a Bell OH-58A, was on the ground adjacent to Pad 1 with its main rotor blades turning when the collision occurred. Pasadena PD operated both helicopters under the provision of 14 Code of Federal Regulations Part 91, as public-use flights. Both helicopters sustained substantial damage. The commercial pilot and two passengers of N911FA received minor injuries. The commercial pilot and tactical flight officer (TFO) of N96BM received minor injuries. Also, one person on the ground received minor injuries. Visual meteorological conditions prevailed, and no flight plans had been filed.

According to Pasadena PD, N911FA was providing traffic support for a college football game at the Rose Bowl in Pasadena, California. The flight departed at 1552, and flew toward the Rose Bowl; the intent was to be gone for a 1 hour flight. At the time of departure for N911FA, weather at the heliport was not a factor. At 1555, about 3 minutes later, N96BM was moved out of the hangar in response to an in-progress call, and placed on the outside edge of Pad 1, in between Pad 1 and Pad 2 facing to the south. The pilot of N96BM had started the engine, and begun the startup sequence.

At 1558, N911FA returned to the heliport due to diminishing weather. The pilot of N911FA made a normal approach from the north to the main pad. From the main pad, the pilot performed a left pedal turn turning the helicopter to the east, and hover-taxied toward pad 2. The pilot then made a right pedal turn, turning the helicopter to the south. As she lowered the collective to land on pad 2, the main rotor blades came into contact with N96BM's main rotor blades.

The air support Lieutenant (Lt.) was interviewed on November 18, 2012. He had observed that throughout the day prior to the accident, the weather had been spotty; clear one moment, cloudy and overcast the next. As N911FA took off, he observed from his office marginal weather conditions. A couple of minutes later, he looked out his window, and noted that the weather was closing in, and that N96BM was on Pad 1 preparing to take off. He walked out of his office toward N96BM, with the intent of telling the flight crew to stand down. He stated that he had been standing by the left door on the outside of N96BM. He observed N911FA returning to base, and thought that was a good thing. He recalled hearing a loud bang, getting knocked to the ground, and then running away from N96BM.

PERSONNEL INFORMATION

N911FA

The 49-year old pilot of N911FA held a commercial pilot certificate with a rating for rotorcraft-helicopter issued on January 17, 1991. The pilot held a second-class medical issued on June 6, 2012, with the limitation that the pilot must have available glasses for near vision. The pilot's estimated total time was 16,200 total hours with an estimated 8,000 hours in the accident make and model. The pilot

had been assigned to the Pasadena PD Air Operations division since 1989; 22 years as a pilot and one year as a Tactical Flight Officer (TFO).

N96BM

The 40-year old pilot of N96BM held a commercial pilot certificate with a rating for rotorcraft-helicopter issued in August of 2010. The pilot held a second class medical issued on March 22, 2012, with no waivers or limitations. The pilot's estimated total time was 13,065 hours with an estimated 725 hours in the accident make and model. The pilot had been assigned to the Pasadena PD Air Operations Division since 2005; 2 years as a pilot and 5 years as a TFO.

WITNESS INFORMATION

Pilot N911FA

According to the pilot of N911FA, her day began at 0530. Throughout the day, she checked weather and noted precipitation/rain during the day. The first two flights of the day were for traffic evaluation with no problems encountered. The pilot reported marginal weather conditions, but made the decision to fly after conferring with her lieutenant that if the weather was not good, she would return to base. The pilot and two passengers departed about 1552; the pilot reported that they were airborne for only a few minutes before returning to the heliport to land due to weather.

While on the return back to the heliport, the pilot had broadcasted her position per protocol. Upon arrival at the heliport, the pilot performed a reconnaissance of the area to make sure there were no people in the area. When she looked at the landing pads, she saw the outline of N96BM on landing pad 1; the pilot was not sure if the main rotor blades were turning or not. The pilot continued the approach, and radioed her intention and location, but received no response from anyone. On short final, she heard a helicopter radio querying if there was "any Pasadena on 02?" She responded, but did not hear the response as her helicopter had gone below the mountains.

On final she observed N96BM on the ground and assumed it to be on pad 1; at the time there was no direct/established communications with the pilot of N96BM. The pilot hover-taxied to Pad 2, and was concentrating on keeping her helicopter in the box for Pad 2. She stated that she was getting on the radios to tell the passengers to stay put, and simultaneously lowered pitch; at that point the, "sky fell." The pilot stated that she had seen two helmets in the helicopter, but did not have eye contact with the pilot or TFO of the other helicopter.

The pilot stated that the windscreen and side windows were wet with water drops. She was looking forward to stay straight and utilizing the chin window and her periphery to land inside the box.

The pilot stated that at the time she did not realize that the parked helicopter (N96BM) was not in the box. Her state of mind was that the other helicopter was in the box, so pay attention to your box when you land, and you'll be fine.

In her experience, she had not observed a helicopter placed outside of the box.

Pilot N96BM

According to the pilot, he had arrived at the heliport for his duty shift at 1500. He had performed a maintenance flight check, and recalled that there were rain cells to the south with 4-5 miles visibility and a 2,000 foot ceiling. About 1530 he spoke to the pilot of N911FA, and that he had told the other pilot that there was weather and rain cells to the south.

He stated that he had been pushing out N96BM when a call for assistance was requested, as N911FA had already departed he moved N96BM to Pad 1. The pilot stated that he placed the helicopter on the outside of Pad 1; he knew they would be off the ground in a couple of minutes or he would be up on radios. The pilot stated that his thought process was that, when he was up on radios he would check the weather, and request the pilot of N911FA start toward the priority call.

The pilot stated that it was not uncommon to place the helicopter outside of the box, and he had witnessed other pilot's do the same. He opined that it was done due to poor water drainage when it rained as well as to keep clearance from the adjacent fuel farm.

Other Witnesses

The Tactical Flight Officer (TFO) for N96BM stated that he and the mechanic were being directed by the pilot as they pushed the helicopter outside, and that they did not place the helicopter inside the box for pad 1, instead it was parked to the west of the box.

The TFO recalled putting on his gear at the helicopter, climbing in and seat belting himself in. The lieutenant came to his side of the helicopter, and asked if they wanted to respond due to the weather. The TFO indicated that the traffic helicopter (N911FA) was still up; once they were airborne, if the weather was bad, they would come back to the heliport. The TFO stated he heard a loud bang and saw the lieutenant run toward a fire extinguisher. At the time, he had not been aware that another helicopter had landed. When he looked up he saw that the main rotor of the helicopter he was sitting in was gone.

The Director of Maintenance was the on duty mechanic on the day of the accident; his mission was to maintain the helicopters, and assist with helicopter movement. He recalled that he assisted with the movement of N96BM outside of the hangar to pad 1. He had not realized that N96BM had been placed outside of the pad 1 landing box until after he disconnected the auxiliary power unit (APU) and had started back to the hangar. The duty mechanic stated that, due to the fact that the helicopter was getting ready to depart, it should not have been an issue; he had observed N911FA on inbound to the heliport. He stated that he had been inside the hangar for about a minute when he heard a loud explosion.

METEOROLOGICAL INFORMATION

Weather obtained at 1628 for the Bob Hope Airport (BUR), Burbank, California, 8 miles west of the accident site, indicated visibility as 3 statute miles, light rain showers, wind from 180-degrees at 6 knots, cloud conditions scattered at 1,100 feet, broken at 1,600 feet, and overcast at 3,100 feet. At 1553, BUR reported weather conditions as visibility 5 statute miles, rain showers, wind from 210-degrees at 6 knots, cloud conditions as scattered at 1,100 feet, broken at 1,900 feet, and overcast 2,600 feet.

Weather obtained at 1647 for El Monte Airport (EMT), El Monte, California, 8 miles southeast of the accident site, indicated visibility as 10 statute miles, calm wind, cloud conditions as few clouds at 1,800 feet, broken at 3,800 feet, and overcast at 4,500 feet. At 1547, EMT reported weather conditions as

visibility 10 statute miles, wind from 180-degrees at 6 knots, clouds conditions, few at 4,200 feet, scattered at 4,800 feet, and overcast at 6,000 feet.

AIRPORT INFORMATION

The Pasadena PD–Benedict Heliport was established in 1972; it was situated on a mesa that overlooks the 210 freeway in Altadena, California. The heliport was not a certificated heliport as it was built prior to California Department of Transportation (DOT) Division of Aeronautics requirements; as such, it had received an exempt status.

According to a letter from the California DOT, dated July 13, 1979, in January of 1973, the heliport was designated under the classification of "public safety agencies," and will be exempted from the Department of Aeronautics heliport regulations. It was deemed that the heliport was exempt, and could continue to operate as such.

The OIC (Officer in Charge) of the air unit responded to the letter submitted by the DOT and the city chose not to pursue that.

WRECKAGE AND IMPACT INFORMATION

On-scene documentation was conducted. The accident had been recorded on video. The recorded video showed that N96BM was moved out of the hangar toward Pad 1. The helicopter was parked to the west and outside of the painted square that denoted Pad 1, which placed N96BM in-between Pad 1 and Pad 2 facing south.

The distance between the outside of Pad 1 to the outside of Pad 2 was 33 feet, as measured by a total station provided by the Pasadena Police Department.

After the impact, both helicopters came to rest upright, with minimal displacement/movement of each helicopter. N911FA came to rest facing toward the northeast, and mostly inside of Pad 2; a portion of the aft skid came to rest outside of the Pad 2 box. N96BM remained to the west of Pad 1.

The transmission and main rotor blades separated from N96BM, and came to rest adjacent to the helicopter. The main rotor blades of N911FA separated from the transmission, and came to rest about 10 feet forward and to the left of the helicopter; directly behind N96BM. The transmission for N911FA remained attached to and inside the helicopter in its relative normal position. One main rotor blade from each helicopter, where they initially contacted each other, came to rest near the hangar, forward of N96BM, and near a chain link fence, behind N96BM.

During the on-site examination, the distance between the two parking pads as well as the distance between Pad 1 and the fuel farm was noted. Measurement of the separation distance between Pad 1 and Pad 2 was measured as 33 feet. The distance between Pad 1 and the fuel farm was measured as 24 feet. According to AC 150/5930-2C Heliport Design section 214 titled Helicopter Parking, parking pads size depends on the number and specific size of the helicopter that will be accommodated at the facility. The minimum distance between parking pads should be one-third the diameter of the main rotor blades. Additionally, under subsection e. fueling (2) it stated not to locate fueling equipment in the TLOF (touchdown and liftoff area), FATO (final approach and takeoff area), or safety area, maintaining a

distance of one-half rotor diameter clearance from objects, and if that was not practical at the existing field to install long fuel hoses.

TEST AND RESEARCH

There was not an established monitored UNICOM frequency. There was also no mechanism to alert ground personnel that a helicopter was arriving to the heliport other than by ground personnel "hearing" it approach. As a result of the accident, the air division established monitored UNICOM and radio procedures for arrival and departure of helicopters at the heliport.

Radio communications were established by the Pasadena PD, and identified in their standard operating procedures. Pilots were required to radio their intentions for departure and landing, along with the direction they were taking off from or direction they were landing. Start-up was identified as a critical time for radio communications as a parked helicopters' pilot had not yet powered up the helicopter and turned on the radios.

Pad 1 was 49x49 feet; the center of pad 1 to its outside edge was 25 feet. The edge of pad 1 to center of pad 2 was 12 feet. Thirty-seven feet separated the center of pad 1 from pad 2.

Pad 2's dimensions were 39 feet on the north side, 27 feet on the south side, with the west and east sides estimated to be about 25 feet.

The OH-58A main rotor blades are 35 feet in diameter, with 11 feet of clearance for this model of helicopter. The fuel pit was measured to be 29 feet from pad 1.

Heliport Evaluation

The Pasadena PD Heliport was evaluated by the California DOT - Division of Aeronautics as requested by the NTSB IIC on December 17, 2012. It was noted that the facility was exempt from state heliport permit requirements under applicable provisions of the California Code of Regulations, Title 21 that had been in effect in 1972, when the heliport was established.

As a result of the evaluation, the following actions were identified that would enhance heliport safety, and bring the facility into conformance with current heliport design standards (Advisory Circular Heliport Design AC 150/5390-2C dated April 24, 2012).

1. Recommend trimming of a 38-foot tall oak tree to a height below the transitional surface or remove the tree entirely. The tree was located 36 feet southwest of the Final Approach and Takeoff Area (FATO); it penetrated the heliport's Federal Aviation Regulation (FAR) Part 77, 2:1 Transitional Surface by approximately 20 feet.

2. Replace hooded light figures with flush green perimeter lights in accordance with Federal Aviation Administration (FAA) AC 150/5390-2C, Heliport Design, paragraph 216.

3. Mark the FATO in accordance with AC 150-5390-2C figures 2-22 and 2-23.

4. Remove all helicopter parking spot markings, and redesign the heliport parking plan in accordance with AC 150-5390-2C, paragraph 214, table 2-1, and figures 2-17 and 2-18.

OTHER INFORMATION

As a result of the accident, along with their own internal review, the Pasadena Police Department made several heliport upgrades, and procedural changes:

Reviewed and updated their standard operating procedures manual
Heliport upgrades included new lighting, markings, pad assignments, obstruction clearance, tree removal, ground obstacle removal, and procedural review.
Increased safety/section meetings for timely identification and response to issues
Continued emphasis on factory and local flight training
Increased ground and flight training for TFO's
Improved section training library for personal development
Resolved irrigation issues associated with flight line drainage
Conducted table top exercises related to lost aircraft/aircraft accident
Increased ride checks with pilots and TFO's to insure compliance with established procedures

History of Flight

Maneuvering-hover	Low altitude operation/event (Defining event)
Landing-flare/touchdown	Collision during takeoff/land

Pilot Information

Certificate:	Commercial	**Age:**	49,Female
Airplane Rating(s):	None	**Seat Occupied:**	Right
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	Unknown
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 2 With waivers/limitations	**Last FAA Medical Exam:**	June 6, 2012
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	July 11, 2011
Flight Time:	(Estimated) 16200 hours (Total, all aircraft), 8000 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Make:	Bell	**Registration:**	N911FA
Model/Series:	OH-58	**Aircraft Category:**	Helicopter
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	None	**Serial Number:**	70-15152
Landing Gear Type:	Skid	**Seats:**	4
Date/Type of Last Inspection:	November 15, 2012 Continuous airworthiness	**Certified Max Gross Wt.:**	
Time Since Last Inspection:		**Engines:**	1 Turbo shaft
Airframe Total Time:	15239 Hrs as of last inspection	**Engine Manufacturer:**	Rolls Royce
ELT:	Not installed	**Engine Model/Series:**	250-C20 MM
Registered Owner:		**Rated Power:**	
Operator:		**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	EMT,296 ft msl	**Distance from Accident Site:**	9 Nautical Miles
Observation Time:	15:47 Local	**Direction from Accident Site:**	130°
Lowest Cloud Condition:	Few / 4200 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	Overcast / 6000 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	6 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	180°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.05 inches Hg	**Temperature/Dew Point:**	19°C / 14°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Altadena, CA (N/A)	**Type of Flight Plan Filed:**	Company VFR
Destination:	Altadena, CA (N/A)	**Type of Clearance:**	None
Departure Time:	15:52 Local	**Type of Airspace:**	Class E

Airport Information

Airport:	Pasadena PD Heliport N/A	**Runway Surface Type:**	Asphalt
Airport Elevation:	1082 ft msl	**Runway Surface Condition:**	Dry
Runway Used:		**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	Traffic pattern

Wreckage and Impact Information

Crew Injuries:	1 Minor	**Aircraft Damage:**	Substantial
Passenger Injuries:	2 Minor	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	3 Minor	**Latitude, Longitude:**	34.183055,-118.170829(est)

Administrative Information

Investigator In Charge (IIC):	Cornejo, Tealeye
Additional Participating Persons:	Rex Hallesy; Federal Aviation Administration; Van Nuys, CA Philip L Sanchez; Pasadena Police Department; Pasadena, CA
Original Publish Date:	December 12, 2016
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=85615

Location:	Altadena, California	**Accident Number:**	WPR13GA044
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Aircraft:	Bell OH-58A	**Aircraft Damage:**	Substantial
Defining Event:	Low altitude operation/event	**Injuries:**	2 Minor
Flight Conducted Under:	Public aircraft		

Analysis

The commercial pilot had conducted traffic evaluation flights earlier in the day. After conferring with her lieutenant, she decided to attempt another flight with the understanding that she would return if the weather was not good. She departed, and after a few minutes, returned to the heliport to land due to deteriorating weather. While the helicopter was airborne, another pilot had moved a helicopter out of the hangar and parked outside of the marked parking pad area designated as "Pad 1." He later stated that he parked outside the pad because of drainage issues and that he was not on the radios because he would be off the ground in a couple of minutes and he did not believe there would be a conflict. The pilot had started the engine and begun the start-up sequence.

Upon return to the heliport, the pilot of the landing helicopter scouted the landing area to make sure it was clear. The pilot observed the other helicopter parked near the parking pad, but due to rain on the windshield, she was not able to determine whether the helicopter was inside or outside of the marked box or if the main rotor blades were turning. The landing pilot stated that, as a result of the rain on her windscreen and side windows, she was looking straight ahead and using the chin window and her periphery to land inside the box. She radioed her intention to land and received no response. She then made the approach to the main pad, assuming that the other helicopter was inside the box for Pad 1, and then hover-taxied toward the adjacent parking pad (Pad 2). She was focused on her landing pad area, and as she lowered the collective to land on Pad 2, the pilot did not confirm adequate clearance, and the main rotor blades of the landing helicopter contacted the main rotor blades of the parked helicopter.

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Probable Cause and Findings

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

The landing pilot's failure to maintain clearance from a parked helicopter and the other pilot's failure to park the helicopter inside of a marked parking pad. Contributing to the accident was the landing pilot's obscured visibility due to moisture on the windscreen.

Findings

Personnel issues	Monitoring other aircraft - Pilot of other aircraft
Environmental issues	Aircraft - Contributed to outcome
Personnel issues	Incorrect action selection - Pilot
Environmental issues	Visibility - Effect on personnel

Factual Information

HISTORY OF FLIGHT

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The pilot stated that at the time she did not realize that the parked helicopter (N96BM) was not in the box. Her state of mind was that the other helicopter was in the box, so pay attention to your box when you land, and you'll be fine.

In her experience, she had not observed a helicopter placed outside of the box.

Pilot N96BM

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Other Witnesses

The Tactical Flight Officer (TFO) for N96BM stated that he and the mechanic were being directed by the pilot as they pushed the helicopter outside, and that they did not place the helicopter inside the box for pad 1, instead it was parked to the west of the box.

The TFO recalled putting on his gear at the helicopter, climbing in and seat belting himself in. The lieutenant came to his side of the helicopter, and asked if they wanted to respond due to the weather. The TFO indicated that the traffic helicopter (N911FA) was still up; once they were airborne, if the weather was bad, they would come back to the heliport. The TFO stated he heard a loud bang and saw the lieutenant run toward a fire extinguisher. At the time, he had not been aware that another helicopter had landed. When he looked up he saw that the main rotor of the helicopter he was sitting in was gone.

The Director of Maintenance was the on duty mechanic on the day of the accident; his mission was to maintain the helicopters, and assist with helicopter movement. He recalled that he assisted with the movement of N96BM outside of the hangar to pad 1. He had not realized that N96BM had been placed outside of the pad 1 landing box until after he disconnected the auxiliary power unit (APU) and had started back to the hangar. The duty mechanic stated that, due to the fact that the helicopter was getting ready to depart, it should not have been an issue; he had observed N911FA on inbound to the heliport. He stated that he had been inside the hangar for about a minute when he heard a loud explosion.

METEOROLOGICAL INFORMATION

Weather obtained at 1628 for the Bob Hope Airport (BUR), Burbank, California, 8 miles west of the accident site, indicated visibility as 3 statute miles, light rain showers, wind from 180-degrees at 6 knots, cloud conditions scattered at 1,100 feet, broken at 1,600 feet, and overcast at 3,100 feet. At 1553, BUR reported weather conditions as visibility 5 statute miles, rain showers, wind from 210-degrees at 6 knots, cloud conditions as scattered at 1,100 feet, broken at 1,900 feet, and overcast 2,600 feet.

Weather obtained at 1647 for El Monte Airport (EMT), El Monte, California, 8 miles southeast of the accident site, indicated visibility as 10 statute miles, calm wind, cloud conditions as few clouds at 1,800 feet, broken at 3,800 feet, and overcast at 4,500 feet. At 1547, EMT reported weather conditions as

visibility 10 statute miles, wind from 180-degrees at 6 knots, clouds conditions, few at 4,200 feet, scattered at 4,800 feet, and overcast at 6,000 feet.

AIRPORT INFORMATION

The Pasadena PD–Benedict Heliport was established in 1972; it was situated on a mesa that overlooks the 210 freeway in Altadena, California. The heliport was not a certificated heliport as it was built prior to California Department of Transportation (DOT) Division of Aeronautics requirements; as such, it had received an exempt status.

According to a letter from the California DOT, dated July 13, 1979, in January of 1973, the heliport was designated under the classification of "public safety agencies," and will be exempted from the Department of Aeronautics heliport regulations. It was deemed that the heliport was exempt, and could continue to operate as such.

The OIC (Officer in Charge) of the air unit responded to the letter submitted by the DOT and the city chose not to pursue that.

WRECKAGE AND IMPACT INFORMATION

On-scene documentation was conducted. The accident had been recorded on video. The recorded video showed that N96BM was moved out of the hangar toward Pad 1. The helicopter was parked to the west and outside of the painted square that denoted Pad 1, which placed N96BM in-between Pad 1 and Pad 2 facing south.

The distance between the outside of Pad 1 to the outside of Pad 2 was 33 feet, as measured by a total station provided by the Pasadena Police Department.

After the impact, both helicopters came to rest upright, with minimal displacement/movement of each helicopter. N911FA came to rest facing toward the northeast, and mostly inside of Pad 2; a portion of the aft skid came to rest outside of the Pad 2 box. N96BM remained to the west of Pad 1.

The transmission and main rotor blades separated from N96BM, and came to rest adjacent to the helicopter. The main rotor blades of N911FA separated from the transmission, and came to rest about 10 feet forward and to the left of the helicopter; directly behind N96BM. The transmission for N911FA remained attached to and inside the helicopter in its relative normal position. One main rotor blade from each helicopter, where they initially contacted each other, came to rest near the hangar, forward of N96BM, and near a chain link fence, behind N96BM.

During the on-site examination, the distance between the two parking pads as well as the distance between Pad 1 and the fuel farm was noted. Measurement of the separation distance between Pad 1 and Pad 2 was measured as 33 feet. The distance between Pad 1 and the fuel farm was measured as 24 feet. According to AC 150/5930-2C Heliport Design section 214 titled Helicopter Parking, parking pads size depends on the number and specific size of the helicopter that will be accommodated at the facility. The minimum distance between parking pads should be one-third the diameter of the main rotor blades. Additionally, under subsection e. fueling (2) it stated not to locate fueling equipment in the TLOF (touchdown and liftoff area), FATO (final approach and takeoff area), or safety area, maintaining a

distance of one-half rotor diameter clearance from objects, and if that was not practical at the existing field to install long fuel hoses.

TEST AND RESEARCH

There was not an established monitored UNICOM frequency. There was also no mechanism to alert ground personnel that a helicopter was arriving to the heliport other than by ground personnel "hearing" it approach. As a result of the accident, the air division established monitored UNICOM and radio procedures for arrival and departure of helicopters at the heliport.

Radio communications were established by the Pasadena PD, and identified in their standard operating procedures. Pilots were required to radio their intentions for departure and landing, along with the direction they were taking off from or direction they were landing. Start-up was identified as a critical time for radio communications as a parked helicopters' pilot had not yet powered up the helicopter and turned on the radios.

Pad 1 was 49x49 feet; the center of pad 1 to its outside edge was 25 feet. The edge of pad 1 to center of pad 2 was 12 feet. Thirty-seven feet separated the center of pad 1 from pad 2.

Pad 2's dimensions were 39 feet on the north side, 27 feet on the south side, with the west and east sides estimated to be about 25 feet.

The OH-58A main rotor blades are 35 feet in diameter, with 11 feet of clearance for this model of helicopter. The fuel pit was measured to be 29 feet from pad 1.

Heliport Evaluation

The Pasadena PD Heliport was evaluated by the California DOT - Division of Aeronautics as requested by the NTSB IIC on December 17, 2012. It was noted that the facility was exempt from state heliport permit requirements under applicable provisions of the California Code of Regulations, Title 21 that had been in effect in 1972, when the heliport was established.

As a result of the evaluation, the following actions were identified that would enhance heliport safety, and bring the facility into conformance with current heliport design standards (Advisory Circular Heliport Design AC 150/5390-2C dated April 24, 2012).

1. Recommend trimming of a 38-foot tall oak tree to a height below the transitional surface or remove the tree entirely. The tree was located 36 feet southwest of the Final Approach and Takeoff Area (FATO); it penetrated the heliport's Federal Aviation Regulation (FAR) Part 77, 2:1 Transitional Surface by approximately 20 feet.

2. Replace hooded light figures with flush green perimeter lights in accordance with Federal Aviation Administration (FAA) AC 150/5390-2C, Heliport Design, paragraph 216.

3. Mark the FATO in accordance with AC 150-5390-2C figures 2-22 and 2-23.

4. Remove all helicopter parking spot markings, and redesign the heliport parking plan in accordance with AC 150-5390-2C, paragraph 214, table 2-1, and figures 2-17 and 2-18.

OTHER INFORMATION

As a result of the accident, along with their own internal review, the Pasadena Police Department made several heliport upgrades, and procedural changes:

Reviewed and updated their standard operating procedures manual
Heliport upgrades included new lighting, markings, pad assignments, obstruction clearance, tree removal, ground obstacle removal, and procedural review.
Increased safety/section meetings for timely identification and response to issues
Continued emphasis on factory and local flight training
Increased ground and flight training for TFO's
Improved section training library for personal development
Resolved irrigation issues associated with flight line drainage
Conducted table top exercises related to lost aircraft/aircraft accident
Increased ride checks with pilots and TFO's to insure compliance with established procedures

History of Flight

Standing-engine(s) operating	Ground collision

Pilot Information

Certificate:	Commercial; Private	**Age:**	40,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	Unknown
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 2 Without waivers/limitations	**Last FAA Medical Exam:**	March 22, 2012
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	May 20, 2011
Flight Time:	(Estimated) 13065 hours (Total, all aircraft), 725 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Make:	Bell	**Registration:**	N96BM
Model/Series:	OH-58A	**Aircraft Category:**	Helicopter
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	None	**Serial Number:**	72-21364
Landing Gear Type:	Skid	**Seats:**	4
Date/Type of Last Inspection:	November 12, 2012 Continuous airworthiness	**Certified Max Gross Wt.:**	
Time Since Last Inspection:		**Engines:**	1 Turbo shaft
Airframe Total Time:	15769 Hrs as of last inspection	**Engine Manufacturer:**	Rolls Royce
ELT:	Not installed	**Engine Model/Series:**	250-C20 MM
Registered Owner:		**Rated Power:**	
Operator:		**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	EMT,296 ft msl	**Distance from Accident Site:**	9 Nautical Miles
Observation Time:	15:47 Local	**Direction from Accident Site:**	130°
Lowest Cloud Condition:	Few / 4200 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	Overcast / 6000 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	6 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	180°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.05 inches Hg	**Temperature/Dew Point:**	19°C / 14°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Altadena, CA (NA)	**Type of Flight Plan Filed:**	Company VFR
Destination:	Altadena, CA (NA)	**Type of Clearance:**	None
Departure Time:		**Type of Airspace:**	Class E

Airport Information

Airport:	Pasadena PD Heliport N/A	**Runway Surface Type:**	Asphalt
Airport Elevation:	1082 ft msl	**Runway Surface Condition:**	Dry
Runway Used:		**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	Traffic pattern

Wreckage and Impact Information

Crew Injuries:	1 Minor	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 Minor	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Minor	**Latitude, Longitude:**	34.183055,-118.170829(est)

Administrative Information

Investigator In Charge (IIC):	Cornejo, Tealeye
Additional Participating Persons:	Rex Hallesy; Federal Aviation Administration; Van Nuys, CA Philip L Sanchez; Pasadena Police Department; Pasadena, CA
Original Publish Date:	December 12, 2016
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=85615

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. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available here.