PRISM

A member of the SGS Group

ROTARY WING NEWSLETTER

December 2022 | Volume XXII | Issue XII

SAFETYWIRE

Tips to Avoid Collisions Between Drones and Helicopters: A Case Study from a Near-midair Collision

(Source: FAA Safety Briefing)

The risk of midair collisions between drones and traditional aircraft is always higher at altitudes where both aircraft share the same airspace. The belief that traditional aircraft won't be flying below 400 feet is a common misconception among drone pilots. Except for takeoff and landing, most fixed-wing aircraft typically operate above 400 feet, but this is not the case with helicopters and agricultural aircraft.

This story features a real-life close encounter between a drone pilot and the crew of an emergency medical helicopter that occurred on April 25, 2022. The account is based upon interviews with the drone pilot, the helicopter pilot, air traffic controllers, and the FAA investigator-in-charge.

The sky was clear above El Paso, Texas. At 9:28 a.m. local time, a remote pilot operating under part 107 launched their drone to perform an aerial survey of a high school tennis court on behalf of a construction company. The drone measured 13.2 in. (335 mm) diagonally with a weight of 1.62 lbs. (734 g).

Figure 1. (Photo courtesy of Google)

The remote pilot was operating the drone from a sidewalk located at the base of a small hill. The tennis courts were located atop a hill across the street (see figure 1).

From the remote pilot's location on the sidewalk below, they had the ability to see the drone throughout the entire mission. They were not using a visual observer. The flight took place outside of controlled airspace and airspace authorization was not required.

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Figure 2 depicts the location of the remote pilot on the sidewalk at the intersection below the tennis courts (inspection area). This location is at the base of the rising terrain where the tennis courts are located. Additionally, there was rising terrain to the west where a football field is located.

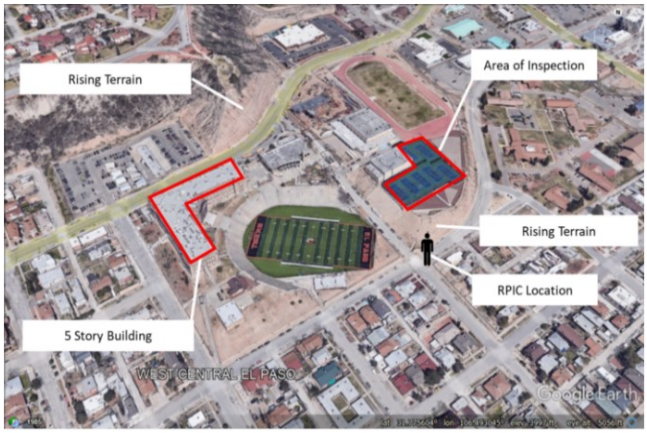

Figure 2. (Photo courtesy of Michael McGee)

The flight took place in an urban environment with heavy noise pollution. In addition, there are multiple heliports located within a five-mile radius. Just west of the football field is a five-story building obstructing the remote pilot's view in that direction.

At 9:45 a.m., the drone was operating above the inspection area and climbed to 396 feet above ground level (AGL).

Figure 3. This is the flight path flown during the inspection of the tennis courts. The flight path illustrates how the remote pilot flew several wide arcs to the south and west of the tennis courts. (Photo courtesy of Michael McGee)

At 9:45 a.m., an emergency medical helicopter was starting up from a helipad located approximately a half mile west of the drone's survey area. The helicopter was enroute to El Paso International Airport (ELP) with a pilot, nurse, and medic aboard. It initially departed on an easterly heading. It then accelerated to 95 mph and turned northeast-bound, approaching the drone survey area from the west.

At approximately 9:46 a.m., the helicopter passed directly underneath the drone traveling at a speed of 94 mph. The two aircraft were at the same latitude and longitude coordinates with less than 100 feet of vertical separation.

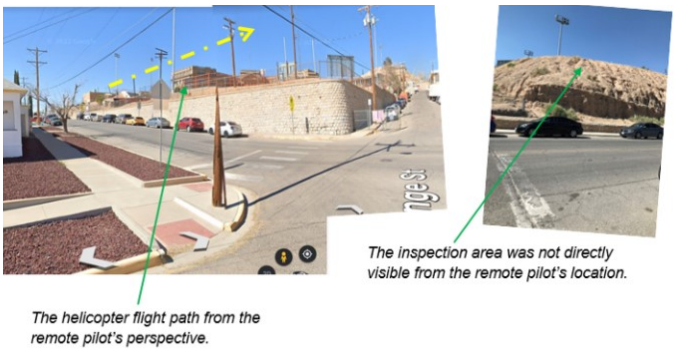

Figure 4. (Photos courtesy of Google)

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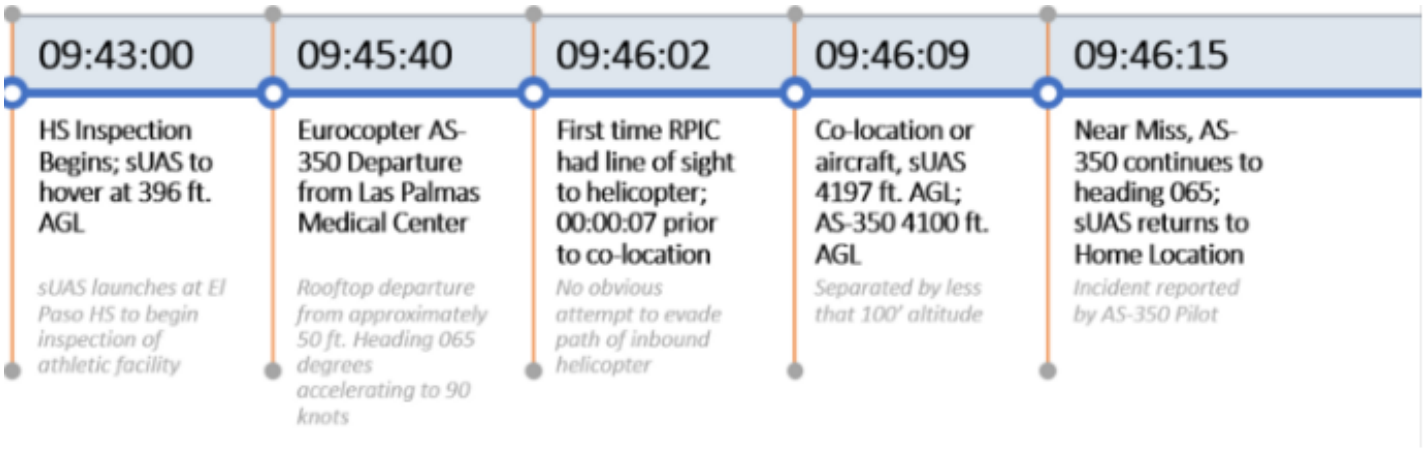
The remote pilot said they heard a helicopter around 14 minutes into their flight. At that point, the drone was at an altitude of 371 feet AGL and 355 feet laterally away from their position.

"I had my drone in sight and proceeded to a stop maneuver to be able to look for the traffic that was behind my line of sight, within approximately 3 seconds, I was able to spot the white and blue helicopter heading on a north-easterly direction at an altitude above my location of approximately of 50 to 100 feet."

The helicopter pilot said visibility was unlimited with no cloud cover. They were flying eastbound into the sun. In the area where the near-midair collision occurred, there are other hospitals with helipads. They were scanning the other hospitals for any possible arriving or departing rotorcraft and did not see the drone until it was too late to maneuver. The pilot added that the drone did not appear to have illuminated navigation or strobe lights. The pilot noted their climb to cruising altitude was slow but typical for the atmospheric conditions this time of year. Hot temperatures in the summer limit a helicopter's ability to climb rapidly.



Timeline. (Illustration courtesy of Michael McGee)

Investigatory Findings

As part of the drone operation preflight familiarization, the remote pilot did not include the number of nearby heliports or note their locations relative to the operational area of the flight. The remote pilot did not consider the direction and distance to heliports located in the vicinity of the planned operation.

FAA investigators determined the remote pilot's location did not afford them with adequate visibility of the surrounding airspace. According to the investigation, there were at least three alternate locations that offered a more adequate view of the surrounding airspace. Part 107 requires a remote

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pilot to perform an assessment of the operating environment prior to flight. This assessment must consider risks to persons and property in the immediate vicinity, both on the surface and in the air. The assessment assists the remote pilot in selecting a location that ensures adequate visibility of the surrounding airspace at all times during the flight. Adequate visibility of the surrounding airspace provides remote pilots with the opportunity to deconflict from other aviation traffic as required by 14 CFR section 107.37.

The remote pilot admitted their location prevented them from seeing or hearing the helicopter until it was too late to maneuver out of the way.

The remote pilot did not use a visual observer to assist in scanning the surrounding airspace for other aviation traffic.

The remote pilot was focused on viewing the controller display during the operation.

Collision Avoidance Strategies

Raising awareness of the potential for midair collisions between drones and helicopters is the first step toward developing effective mitigation strategies.

Photo illustration of a drone within feet of a helicopter.

Altitude

Whenever possible, remote pilots are encouraged to fly at the minimum altitudes necessary for the planned operation. Operating at lower altitudes reduces the likelihood of a midair collision. Some aircraft, including helicopters and agricultural aircraft, often fly below 400 feet and routinely share the same airspace as drones.

Flashing Lights

Remote pilots are encouraged to use anti-collision lights during daylight operations. The use of anti-collision lights can aid other pilots in identifying drones.

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Preflight Assessment

As required by regulation, remote pilots must assess the operating environment prior to flight. This assessment must consider the risk to other aircraft in the vicinity of the planned operation. Remote pilots planning flights in urban areas are encouraged to include helipad locations in their preflight planning assessment. Specifically, they should consider the direction and distance of helipads in relation to the operational area of their flight. Remote pilots are reminded that helicopters arriving or departing from helipads routinely operate at low altitudes and speeds in excess of 130 mph.

Location

Identifying the direction and distance of helipads can assist the remote pilot in selecting the best location for the ground control station. This information can assist the remote pilot in selecting the appropriate number and physical location of visual observers needed for the operation.

VLOS

Any effective mitigation strategy for collision avoidance depends upon an understanding of the visual line of sight (VLOS) concept. In each of the collisions between drones and helicopters investigated by the FAA, the helicopter pilots and drone pilots reported not seeing the other aircraft before colliding or seeing them too late to avoid a collision. Each of the drone pilots stated they were flying VLOS and acknowledged their responsibility for yielding to other aircraft.

During their interviews, the drone pilots described VLOS as the ability to see their drone at all times during the flight. However, they failed to explain how they could simultaneously observe the airspace for other aircraft. Visual line of sight aircraft operation is defined in 14 CFR section 107.31 and requires both the ability to see the drone at any time and observe the airspace for other aircraft. Section 107.37 requires the remote pilot to yield the right of way to all aircraft and not create a collision hazard.

Photo of FAASTeam Representative and DronePro Vic Moss.

According to FAA Advisory Circular 90–48D, Pilots' Role in Collision Avoidance, on average it takes 12.5 seconds for an undistracted pilot to react to another aircraft. A helicopter traveling at 115 mph covers a half mile in 12.5 seconds. Remote pilots and visual observers are encouraged to ensure they can scan the surrounding airspace to at least half a mile in all directions. Additionally, the view of the surrounding airspace should extend down to the horizon and be free of obstacles or obstructions. If unable, remote pilots should incorporate additional mitigations to their planned operations to ensure an acceptable level of safety.

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Watch "The Rotorcraft Collective: Sharing the Airspace with Drones"

This video for helicopter pilots outlines 12 tips for avoiding collisions with drones. It is produced by the FAA Safety Team (FAASTeam) in collaboration with the United States Helicopter Safety Team (USHST), Helicopter Association International (HAI), and the Helicopter Institute in Dallas.

Federal Aviation Administration

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USHST United States Helicopter Safety Team

Monthly Safety Report November 2022

The USHST is a regional partner to the Vertical Aviation Safety Team (VAST).

USHST GOAL: Reduce the 5 year average fatal US helicopter accident rate to **0.55** fatal accidents per 100K hrs by 2025

USHST Vision: A Civil Helicopter Community with Zero Fatal Accidents

Safety by the Numbers!

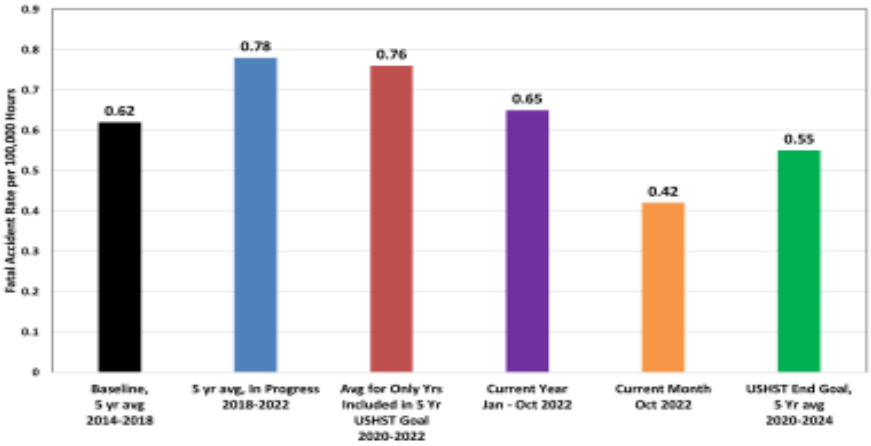
Metric	2018 - 2022	2017 - 2021
Avg Fatal Acc Rate	0.78	0.76
Avg Accident Rate	4.25	4.04
Year To Date	**Current Year (CY22)**	**Previous Year (CY21)**
Fatal Accidents	15	17
Accidents	110	99
Fatalities	25	34

Average number of days between fatal accidents:

2018: 14 days
2019: 16 days
2020: 18 days
2021: 17 days
2022: 19 days

Longest time between fatal accidents (past 5 yrs):

107 days (2020)



Each year the U.S. helicopter industry safely flies approx. 3 million flight hours and **every** second of **every** flight must be handled with professionalism.

Fatal Accident Counter

77 : 18 : 16 : 56

Days : Hours : Mins : Secs

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Did "YOU" Know?

In the US there are **12,000 +** helicopters, **32,000 +** helicopter pilots and over **292,000** aircraft mechanics!

The USHST has identified the following industries for **OUTREACH**:

Personal/Private,
Helicopter Air Ambulance (HAA),
Commercial and Aerial Application

Your participation in joining our vision of zero fatal accidents is important to us. To determine how your interests best align with active USHST efforts, please click the link below to complete the form and submit.

JOIN/FOLLOW USHST

USHST Facebook (2532 Members, 11 New) USHST LinkedIn USHST Twitter

Helicopter Safety OUTREACH events:

- Next USHST All Hands Webinar - **November 14th**, 1pm EST Register Here!
  Previous All Hands - (Sep 26, 2022)
- ROTOR Helicopter Association International - Upcoming Events
- Helicopter Safety Alliance - Upcoming Events

Safety Enhancement Quick List

U.S. Helicopter Safety Team | **Helicopter – Safety Enhancements**
Our Vision: A civil helicopter community with zero fatal accidents

Loss of Control - Inflight (LOC-I), Unintended Flight into IMC (UIMC), Low Altitude Operations (LALT).

USHST continues to work on the implementation of 16 Helicopter - Safety Enhancements (H-SE) developed through data-driven analysis of 104 fatal accidents. The H-SE's use Outreach, Policy, Technology/Equipment, and Training to reduce fatal accidents in these categories.

H-SE 116: Make & Model Transition Training

Transition training in the helicopter community is not uniformly applied, leading to accidents resulting from unfamiliarity with airframe and/or equipment.

1. USHST will review best practices/recommendations related to transition training developed and published by other organizations (e.g., AOPA, EAA, GAJSC). USHST will use materials to create updated/unified recommendations regarding transition training in helicopters.
2. USHST will work with FAA & industry to promote/educate on the new unified recommendations for transition training in helicopters.
3. USHST will work with industry to increase implementation of transition training toolkit by expanding capability for ease of day-to-day operational use.
4. USHST will promote creation of helicopter type-specific groups (e.g., type clubs) to establish a more formalized network for ongoing information sharing regarding transition training.

USHST PRIORITY Safety Resources: Videos Safety Apps USHST Report on Safety Enhancements

US Helicopter Safety Team Press Release (November 2022):
USHST Searching for Next Industry Co-Chair

VAST VERTICAL AVIATION SAFETY TEAM — USHST United States Helicopter Safety Team

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SAFETY MANAGER'S CORNER

ATTACHMENT 24 - SAFETY MANAGEMENT SYSTEM (SMS) COMPONENTS QUESTIONAIRE AND ACCIDENT HISTORY

The USFS aviation program views Safety Management Systems (SMS) as a critical element for contract evaluation. This attachment seeks to identify effective and safe aviation operations of an Offeror that include implemented policies and practices that support the Offeror's SMS. These components should be fully integrated into the daily activities of an Offeror. A complete response is required to accurately assess the Offeror's level of implementation and effectiveness and Contractor's will be held to these standards during contract performance.

This is a copy of the new Attachment 24 SRM section from a US Forest Service contract. It is marked up in red font with references to which PRISM SMS Tool you might use to provide evidence for that question. Note that some questions can only be answered by your Operations Manual, which is outside the scope of PRISM ARMOR. There may be some USFS regions using the old format so please use the version requested by the USFS in your area. Feel free to contact PRISM customer support for some further guidance if needed. For the full document with every section notated, please see the training section of the ARMOR website. CLICK HERE TO GO STRAIGHT THERE

Safety Risk Management			
11	2	3.2.1.1 3.2.2.1	3.2.1.1 - Provide evidence that the Offeror developed and maintains a formal process to identify and track hazards including risk Analysis (Exposure), Risk Assessment (Severity and likelihood), Decision Making (Mitigations). ARMOR RPT, RAT, IEP, Assurance Checks, Risk Matrix Tool 3.2.2.1 - Has the Offer developed and maintained a formal process that ensures analysis, assessment and control of the safety risks associated with identified records.
12	2	3.2.1.1	Provide evidence that the Offeror has a hazard/threat reporting program. ARMOR RPT, RAT
13	2	3.2.2	Provide evidence that the Offeror has a policy to daily conduct operational risk assessment and or use a flight risk assessment tool, customized and appropriate for their operation. PRISM SMS Manual, ARMOR FRAT, GRAT
14	2	3.1.2.1	Provide evidence that there is a process to mitigate high scoring risk assessments or obtain and record approval of the Offeror's management when it exceeds a predetermined level. ARMOR FRAT, GRAT

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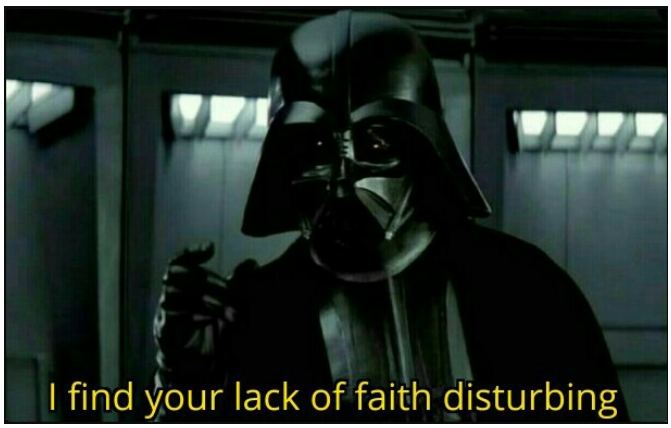
Quote of the Month

"**A true professional is always looking for continued growth and knowledge** "
– Kodey Bogart

The aviation industry is never stagnant, we are always looking to enhance safety, our aircraft, and our equipment. We should strive for the same mentality in ourselves. If we don't push ourselves to grow as professionals, we will not only be left behind, we are bound to repeat the same mistakes.

When someone says: "There's no way you'll make it home for the holidays"



Happy Holidays!

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 # PRISM PREFERS

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UPCOMING COURSES

March 28 to March 30, 2023– PRISM Course

Safety Management Systems Training

Denver, CO

September 26 to September 28, 2023– PRISM Course

Safety Management Systems Training

Denver, CO

Go to Upcoming Training Classes to register.