



Aviation Investigation Final Report

Location:	San Diego, California	Accident Number:	WPR23LA045
Date & Time:	November 22, 2022, 17:57 Local	Registration:	N160AQ (A1); 166583 (A2)
Aircraft:	Sikorsky UH-60A (A1); Sikorsky MH-60R (A2)	Aircraft Damage:	Substantial (A1); Substantial (A2)
Defining Event:	Collision during takeoff/land	Injuries:	2 None (A1); 3 None (A2)
Flight Conducted Under:	Part 91: General aviation - Instructional (A1); Armed Forces (A2)		

Analysis

While conducting nighttime training at a tower-controlled airport, two helicopters were involved in a midair collision. A common practice at the airport was for the air traffic control tower (ATCT) local control controller (controller) to control helicopter operations on a non-movement portion of runway 26L called the underrun.

The first helicopter to arrive was cleared for the option to land on the runway 26L underrun, at their own risk, but remained under control of the controller. The first helicopter flew one traffic pattern and then returned to the underrun and landed. The second helicopter arrived at the airport about 8 minutes later, and was cleared by the controller for the option to land on the runway 26L underrun. After the second helicopter crew reported that the first helicopter was in sight, the controller instructed them to “maintain visual separation” from the first helicopter, which the crew of the second helicopter acknowledged.

While the first helicopter was on the underrun’s surface area preparing to take off, the second helicopter turned to the base leg of the traffic pattern. The controller believed that the second helicopter may have turned early and would possibly overfly the first helicopter, so he told the first helicopter that he needed him to take off; the pilot replied that they were taking off. The controller then made two radio calls to the second helicopter, one not received, and the other garbled. The controller then instructed the second helicopter to perform a go-around on the north side of runway 26L. While the pilot of the first helicopter was performing the takeoff, he saw the second helicopter overhead and attempted evasive action. While maneuvering, the main rotor blades of the first helicopter struck the second helicopter’s stabilator, which

substantially damaged the main rotor blades of the first helicopter and the stabilator of the second helicopter. Both helicopters then landed on the airfield and shut down.

The takeoff instructions for the first helicopter, followed by the go around instructions for the second helicopter, combined with the night conditions, likely created a scenario where the second helicopter crew lost visual contact with the first helicopter and overtook it from overhead. The controller was concerned that the second helicopter would overfly the first helicopter but did not issue a safety alert. The lack of a safety alert likely prevented the flight crews from understanding how close the helicopters were to each other, as well as their urgent need to take action to avoid a collision.

Probable Cause and Findings

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

The failure of the crewmembers of the second helicopter to maintain visual separation with the first helicopter while complying with the LC controller's instruction to go around. Contributing to the accident were the nighttime conditions and the lack of a safety alert from the controller to either helicopter.

Findings

Personnel issues (A1)	Monitoring other aircraft - Pilot of other aircraft
Personnel issues (A1)	Issuing instructions - ATC personnel
Personnel issues (A2)	Monitoring other aircraft - Flight crew
Personnel issues (A2)	Issuing instructions - ATC personnel

Factual Information

History of Flight

Takeoff (A1)	Collision during takeoff/land (Defining event)
Landing (A2)	Midair collision

On November 22, 2022, about 1750 Pacific standard time, a Sikorsky UH-60A, N160AQ, and a U.S. Navy Sikorsky MH-60R, 166583, were substantially damaged when they were involved in a mid-air accident near San Diego, California. There were no injuries to the two pilots in the UH-60, or the two pilots and one non-flying crewmember in the MH-60R. The UH-60 was operated as a Title 14 *Code of Federal Regulations* Part 91 training flight. The MH-60R was operated as an Armed Forces public use flight.

According to the pilot-in-command (PIC) of the UH-60A (Copter 129), he and a second pilot were conducting night vision goggle training. ADS-B data showed that Copter 129 departed Gillespie Field Airport (SEE) San Diego, California, about 1741 and proceeded to Brown Field Municipal Airport (SDM) San Diego, California. A review of the audio recording between the controller and Copter 129 revealed the initial contact and arrival to SDM was uneventful. About 1748, the controller asked Copter 129 if they could accept the underrun of runway 26L for landing at their own risk, and the pilot of Copter 129 accepted the underrun (Figure 1).

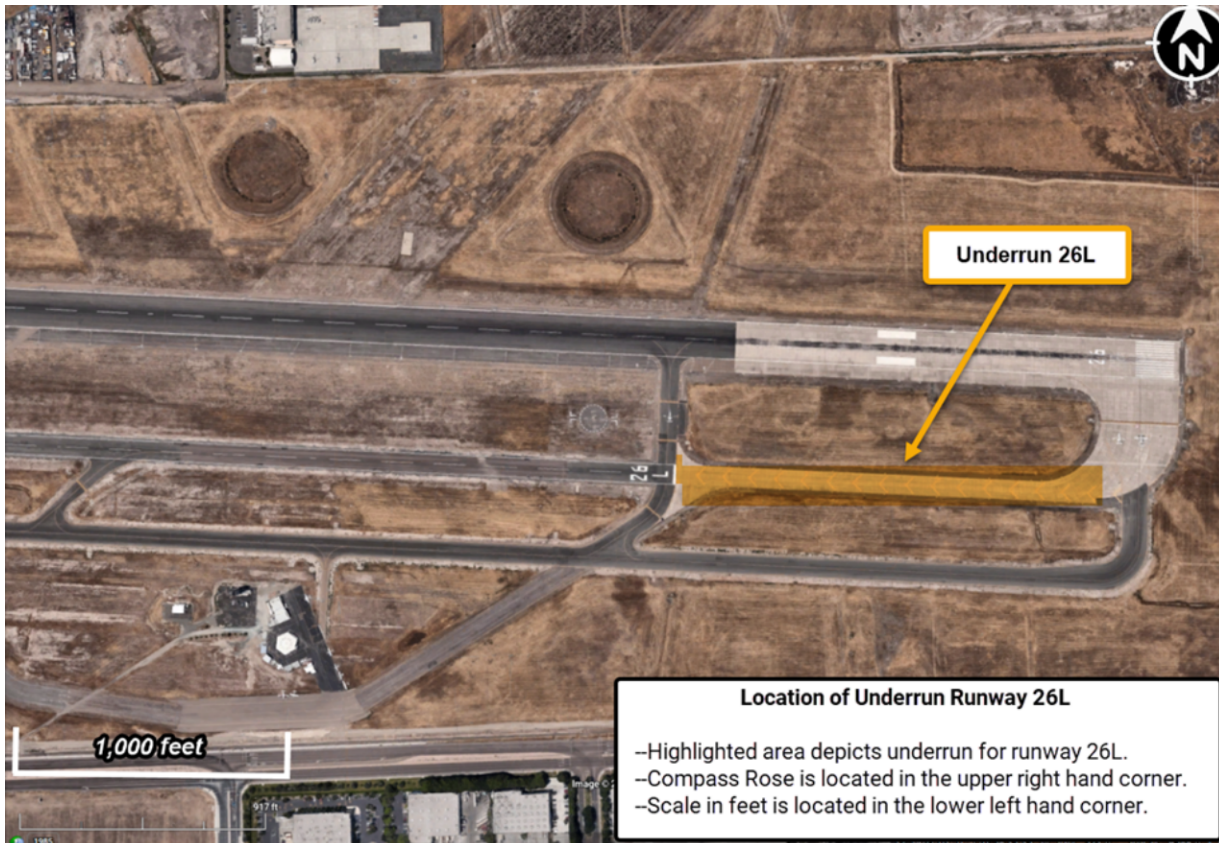


Figure 1. Google Earth image of SDM, showing the underrun runway 26L.

ADS-B data showed that Copter 129, as instructed by the controller, crossed the airport mid-field, at or above 2,000 ft mean sea level (msl), and entered the left traffic pattern for landing on the underrun of runway 26L. At 1753:50 the controller instructed Copter 129 to continue in the left closed pattern due to traffic, which the pilot read back. ADS-B data showed that after Copter 129 arrived to the underrun, it then took off, flew one traffic pattern, and again landed on the underrun.

According to the PIC of the MH-60R (Navy 410/Seahawk 410), the crew consisted of two pilots and a non-flying crewmember. About 1754, Navy 410 made their initial contact with ATCT while they were about 5 miles west of the airport. The controller instructed Navy 410 to enter the downwind for underrun runway 26L. The pilot read back "left downwind for runway 26L." The controller then asked if they could accept the underrun at their own risk. The pilot responded with "affirmative." About 30 seconds later, the controller cleared Copter 129 for the option to land on the runway 26L underrun and the pilot acknowledged the instruction. About 1756, the controller informed Navy 410 that they were number 2 following a helicopter on short final for the runway 26L underrun, then cleared Navy 410 for the option to land on the runway 26L underrun, and instructed them to make left closed traffic. Navy 410 stated they had the traffic in sight. The controller further instructed Navy 410 to maintain visual separation from

the helicopter on the underrun. The pilot responded that they “copied all.” About 1756, Navy 410 began to use the callsign Seahawk 410, which continued for the remainder of the flight.

About 1757, according to the controller, he saw that Seahawk 410 appeared to have turned to their base leg early. He then instructed Copter 129 that he needed them “on the go.” The pilot responded with, “Copter 129 on the go.” About 4 seconds later, the controller advised Seahawk 410 that, “the copter on the go was going to the left.” Seconds later, the pilot of Seahawk 410 asked the controller to repeat the instruction. The controller then stated, “Seahawk 410 verify you’re overflying...Navy.” About 3 seconds later, the controller instructed Seahawk 410 to, “go around the northside of runway 26L.” The pilot responded, “Seahawk 4.” According to the controller, he instructed Seahawk 410 to go around after he became nervous that they were either going to be overflying Copter 129 or were going to the other runway [runway 26R]. About 1757, the pilot of Copter 129 stated, “Mayday, Mayday, Mayday Copter 129.”

According to the crew of Copter 129, after departing, and while between 200 to 500 ft above ground level (agl) he saw another helicopter overhead as it appeared in the upper window above his head. He initiated maneuvers to avoid the helicopter, including lowering the collective and applying right cyclic. He then felt and heard the impact.

According to the crew of Seahawk 410, after turning to the final approach leg and aligning with runway 26L, while about 500 ft agl at about 50 knots, the controller directed them to, “go around the north side of 26L.” While over the first half of the runway, the PIC felt the other helicopter impact them on the aft-bottom portion of their helicopter and saw debris fly up under the rotor arc. The pilot then landed on runway 26R, repositioned off the runway, and shut down the helicopter.

Postaccident examination revealed that Copter 129 sustained substantial damage to the 4 main rotor blade tips, 1 tail rotor blade, and the vertical stabilizer. Seahawk 410 sustained substantial damage to the left side of the stabilator.

During postaccident interviews, ATCT personnel explained that the underrun was a non-movement portion of runway 26L, about 1,800 to 2,000 ft long, that was neither maintained by the airport nor lighted. The underrun was used for helicopter operations by civilian and military helicopters without written procedures. According to the air traffic manager, runway 26L was not approved for UH-60 helicopters to touch down on the runway because of the weight restriction. A review of airport data revealed the weight bearing capacity for runway 26L was 12,500 pounds.

FAA Order JO 7110.65Z, Air Traffic Control

Chapter 3, Section 11, Helicopter Operations, paragraph 3-11-4, Helicopter Arrival Separation, stated in part: *“Separate an arriving helicopter from other helicopters by ensuring that it does not land until one of the following conditions exists: b. A preceding, departing helicopter has left the landing area.”*

Chapter 2, Section 1, General Control, paragraph 2-1-6, Safety Alert, stated in part:

“Issue a safety alert to an aircraft if you are aware the aircraft is in a position/altitude that, in your judgment, places it in unsafe proximity to terrain, obstructions, or other aircraft. Once the pilot informs you action is being taken to resolve the situation, you may discontinue the issuance of further alerts. Do not assume that because someone else has responsibility for the aircraft that the unsafe situation has been observed and the safety alert issued; inform the appropriate controller.”

According to the Aeronautical Information Manual (AIM) *“If takeoff is requested from nonmovement areas, an area not authorized for helicopter use, an area not visible from the tower, an unlighted area at night, or an area off the airport, the phraseology “DEPARTURE FROM (requested location) WILL BE AT YOUR OWN RISK (additional instructions, as necessary).”* Additionally, the AIM stated, in part, that the *“Cleared for the Option” procedure will permit an instructor, flight examiner or pilot the option to make a touch-and-go, low approach, missed approach, stop-and-go, or full stop landing.”*

Pilot Information (A1)

Certificate:	Commercial; Flight instructor	Age:	32, Male
Airplane Rating(s):	None	Seat Occupied:	Left
Other Aircraft Rating(s):	Helicopter	Restraint Used:	5-point
Instrument Rating(s):	Helicopter	Second Pilot Present:	Yes
Instructor Rating(s):	Helicopter; Instrument helicopter	Toxicology Performed:	
Medical Certification:	Class 2 Without waivers/limitations	Last FAA Medical Exam:	February 24, 2022
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	September 5, 2022
Flight Time:	3395 hours (Total, all aircraft), 1725 hours (Total, this make and model), 3000 hours (Pilot In Command, all aircraft), 21 hours (Last 90 days, all aircraft), 9 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft)		

Co-pilot Information (A1)

Certificate:	Airline transport; Flight instructor	Age:	41, Male
Airplane Rating(s):	Single-engine land	Seat Occupied:	Right
Other Aircraft Rating(s):	Helicopter	Restraint Used:	5-point
Instrument Rating(s):	Helicopter	Second Pilot Present:	Yes
Instructor Rating(s):	Helicopter; Instrument helicopter	Toxicology Performed:	
Medical Certification:	Class 2 Without waivers/limitations	Last FAA Medical Exam:	November 12, 2021
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	June 21, 2022
Flight Time:	11493 hours (Total, all aircraft), 675 hours (Total, this make and model), 11451 hours (Pilot In Command, all aircraft), 101 hours (Last 90 days, all aircraft), 15 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft)		

Pilot Information (A2)

Certificate:	Military	Age:	31, Female
Airplane Rating(s):	None	Seat Occupied:	Left
Other Aircraft Rating(s):	Helicopter	Restraint Used:	5-point
Instrument Rating(s):	Helicopter	Second Pilot Present:	Yes
Instructor Rating(s):	Helicopter	Toxicology Performed:	
Medical Certification:	Class 1 Without waivers/limitations	Last FAA Medical Exam:	June 14, 2022
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	July 12, 2022
Flight Time:	1235 hours (Total, all aircraft), 1030 hours (Total, this make and model), 480 hours (Pilot In Command, all aircraft), 46 hours (Last 90 days, all aircraft), 13 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft)		

Co-pilot Information (A2)

Certificate:	Military	Age:	30, Female
Airplane Rating(s):	None	Seat Occupied:	Right
Other Aircraft Rating(s):	Helicopter	Restraint Used:	5-point
Instrument Rating(s):	Helicopter	Second Pilot Present:	Yes
Instructor Rating(s):	None	Toxicology Performed:	
Medical Certification:	Class 1 With waivers/limitations	Last FAA Medical Exam:	November 15, 2022
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	May 19, 2022
Flight Time:	820 hours (Total, all aircraft), 616 hours (Total, this make and model), 224 hours (Pilot In Command, all aircraft), 5 hours (Last 90 days, all aircraft), 5 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft)		

Other flight crew Information (A2)

Certificate:	None	Age:	Male
Airplane Rating(s):	None	Seat Occupied:	Rear
Other Aircraft Rating(s):	None	Restraint Used:	5-point
Instrument Rating(s):	None	Second Pilot Present:	Yes
Instructor Rating(s):	None	Toxicology Performed:	
Medical Certification:	None None	Last FAA Medical Exam:	
Occupational Pilot:	No	Last Flight Review or Equivalent:	
Flight Time:	1454 hours (Total, all aircraft), 1454 hours (Total, this make and model)		

Aircraft and Owner/Operator Information (A1)

Aircraft Make:	Sikorsky	Registration:	N160AQ
Model/Series:	UH-60A	Aircraft Category:	Helicopter
Year of Manufacture:	1982	Amateur Built:	
Airworthiness Certificate:	Restricted (Special)	Serial Number:	81-23588
Landing Gear Type:	Tailwheel	Seats:	4
Date/Type of Last Inspection:	April 16, 2022 Continuous airworthiness	Certified Max Gross Wt.:	22000 lbs
Time Since Last Inspection:	4702 Hrs	Engines:	2 Turbo shaft
Airframe Total Time:	as of last inspection	Engine Manufacturer:	General Electric
ELT:	C126 installed, not activated	Engine Model/Series:	T700-GE-700
Registered Owner:	CORMORANT VENTURE LLC	Rated Power:	1318
Operator:	HeliStream Inc.	Operating Certificate(s) Held:	Rotorcraft external load (133), On-demand air taxi (135), Agricultural aircraft (137), Pilot school (141), Certificate of authorization or waiver (COA)
Operator Does Business As:		Operator Designator Code:	JMXA

Aircraft and Owner/Operator Information (A2)

Aircraft Make:	Sikorsky	Registration:	166583
Model/Series:	MH-60R	Aircraft Category:	Helicopter
Year of Manufacture:	2010	Amateur Built:	
Airworthiness Certificate:	Normal	Serial Number:	166583
Landing Gear Type:	Tailwheel	Seats:	4
Date/Type of Last Inspection:	Unknown	Certified Max Gross Wt.:	23500 lbs
Time Since Last Inspection:		Engines:	2 Turbo shaft
Airframe Total Time:		Engine Manufacturer:	General Electric
ELT:	Installed	Engine Model/Series:	T700-GE-401C
Registered Owner:	U.S. Navy	Rated Power:	441 Horsepower
Operator:	U.S. Navy	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Night
Observation Facility, Elevation:	KSDM, 521 ft msl	Distance from Accident Site:	1 Nautical Miles
Observation Time:	17:53 Local	Direction from Accident Site:	286°
Lowest Cloud Condition:	Clear	Visibility:	10 miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	/	Turbulence Type Forecast/Actual:	None / None
Wind Direction:		Turbulence Severity Forecast/Actual:	N/A / N/A
Altimeter Setting:	30.04 inches Hg	Temperature/Dew Point:	14°C / 5°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	El Cajon, CA (SEE) (A1); San Diego, CA (NZY) (A2)	Type of Flight Plan Filed:	Company VFR (A1); Military VFR (A2)
Destination:	San Diego, CA (A1); San Diego, CA (NZY) (A2)	Type of Clearance:	VFR (A1); VFR (A2)
Departure Time:	17:45 Local (A1); 17:25 Local (A2)	Type of Airspace:	Class D (A1); Class D (A2)

Airport Information

Airport:	Brown Field Municipal Airport SDM	Runway Surface Type:	Concrete
Airport Elevation:	526 ft msl	Runway Surface Condition:	Dry;Vegetation
Runway Used:	26L Underrun	IFR Approach:	None
Runway Length/Width:	3185 ft / 75 ft	VFR Approach/Landing:	Touch and go;Traffic pattern

Wreckage and Impact Information (A1)

Crew Injuries:	2 None	Aircraft Damage:	Substantial
Passenger Injuries:	N/A	Aircraft Fire:	None
Ground Injuries:		Aircraft Explosion:	None
Total Injuries:	2 None	Latitude, Longitude:	32.57268,-116.98031

Wreckage and Impact Information (A2)

Crew Injuries:	3 None	Aircraft Damage:	Substantial
Passenger Injuries:	N/A	Aircraft Fire:	None
Ground Injuries:		Aircraft Explosion:	None
Total Injuries:	3 None	Latitude, Longitude:	32.57268,-116.98031

Preventing Similar Accidents

Prevent Midair Collisions (SA-058)

The Problem

The "see-and-avoid" concept has long been the foundation of midair collision prevention. However, the inherent limitations of this concept, including human limitations, environmental conditions, aircraft blind spots, and operational distractions, leave even the most diligent pilot vulnerable to the threat of a midair collision with an unseen aircraft. Technologies in the cockpit that display or alert of traffic conflicts, such as traffic advisory systems and automatic dependent surveillance–broadcast (ADS-B), can help pilots become aware of and maintain separation from nearby aircraft. Such systems can augment reality and help compensate for the limitations of visually searching for traffic.

What can you do?

- Educate yourself about the benefits of flying an aircraft equipped with technologies that aid in collision avoidance. Whether you are flying in congested airspace or a remote location, a cockpit display or alert of traffic information will increase your awareness of surrounding traffic.
- Become familiar with the symbology, display controls, alerting criteria, and limitations of such technologies in your aircraft, whether the systems are portable or installed in the cockpit. High-density traffic around airports can make interpreting a traffic display challenging due to display clutter, false traffic alerts, and system limitations.
- Use information provided by such technologies to separate your aircraft from traffic before aggressive, evasive maneuvering is required. Often, slight changes in rate of climb or descent, altitude, or direction can significantly reduce the risk of a midair collision long before the conflicting aircraft has been seen.
- Remember that while such technologies can significantly enhance your awareness of traffic around you, unless your system is also capable of providing resolution advisories, visual acquisition of and separation from traffic is your primary means of collision avoidance (when weather conditions allow).

See <https://www.nts.gov/Advocacy/safety-alerts/Documents/SA-058.pdf> for additional resources.

The NTSB presents this information to prevent recurrence of similar accidents. Note that this should not be considered guidance from the regulator, nor does this supersede existing FAA Regulations (FARs).

Administrative Information

Investigator In Charge (IIC):	Salazar, Fabian
Additional Participating Persons:	Roger Messick; Federal Aviation Administration; San Diego, CA Alex Thill; US Navy; San Diego, CA Jonathan C. Cantwell; Sikorsky a Lockheed Company; Stratford, CT
Original Publish Date:	December 5, 2024
Last Revision Date:	
Investigation Class:	Class 3
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=106354

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

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