March 7, 2025 Aviation Investigation Report AIR-25-01

Deconflict Airplane and Helicopter Traffic in the Vicinity of Ronald Reagan Washington National Airport

Introduction

The National Transportation Safety Board (NTSB) is providing the following information to urge the Federal Aviation Administration (FAA) to take immediate action on the safety recommendations in this report concerning the potential for midair collisions between traffic on helicopter Route 4 and airplanes landing on runway 33 or departing runway 15 at Ronald Reagan Washington National Airport (DCA). We identified this issue during our ongoing investigation of the midair collision involving a US Army Sikorsky UH-60L and PSA Airlines flight 5342, a Mitsubishi Heavy Industries (MHI) RJ Aviation (formerly Bombardier) CL-600-2C10 (CRJ700) that occurred over the Potomac River in southwest Washington, DC, on January 29, 2025.

Background and Analysis

On January 29, 2025, about 2048 eastern standard time (EST), a Sikorsky UH-60L, operated by the US Army under the callsign PAT25, and PSA Airlines flight 5342, an MHI RJ Aviation CL-600-2C10, N709PS, collided in flight about 0.5 nautical miles (nm) southeast of runway 33 at Ronald Reagan Washington National Airport (DCA), Arlington, Virginia, and impacted the Potomac River in southwest Washington, DC.[1]

The 2 pilots, 2 flight attendants, and 60 passengers aboard the airplane and all 3 crewmembers aboard the helicopter were fatally injured. Both aircraft were destroyed as a result of the accident. Flight 5342 was operating under the provisions of Title 14 *Code of Federal Regulations* (*CFR*) Part 121 as a scheduled domestic passenger flight from Wichita Dwight D. Eisenhower National Airport (ICT), Wichita, Kansas, to DCA, departing ICT at 1839 EST. PAT25 originated from Davison Army Airfield (DAA), Fort Belvoir, Virginia, at 1845 EST on a visual flight rules (VFR) flight

[1] Visit the investigation page for this accident at ntsb.gov for additional information.

plan for the pilot's annual standardization evaluation with the use of night vision goggles. Night visual meteorological conditions prevailed in the area of DCA at the time of the accident.

Preliminary air traffic control (ATC) information provided by the FAA revealed that at 2033:41, PAT25 was about 15 nm northwest of DCA and requested helicopter Route 1 to Route 4 to DAA. The DCA local controller approved this request.[2]

At 2043:06, when the airplane was about 10.5 nm south of the airport, flight 5342 contacted DCA tower and checked in on the Mount Vernon visual approach to runway 1. The controller asked the crew of flight 5342 if they could accept runway 33 for landing, and the flight crew accepted. At this time, PAT25 was traveling south along the Potomac River and flight 5342 was traveling north.

At 2046:01, the controller advised PAT25 that traffic just south of the Wilson Bridge was a CRJ (flight 5342) at 1,200 ft circling to runway 33. PAT25 confirmed 7 seconds later that they had the traffic in sight and requested visual separation, which the controller approved. About this time, PAT25 was crossing the Tidal Basin and continuing southbound. The controller cleared other jet traffic on runway 1 for departure with no delay at 2046:47.

At 2047:39, with the helicopter south of Hains Point (located at the confluence of the Potomac and Anacostia rivers and a "noncompulsory" reporting point, as indicated on the FAA's Baltimore-Washington Helicopter Route Chart), the controller asked the crew of PAT25 to confirm that they had the CRJ in sight. An aural conflict alert in the tower can be heard in the background of the ATC recording at this time. About 4 seconds later, the controller instructed PAT25 to pass behind the CRJ; PAT25 immediately confirmed that the traffic was in sight and again requested visual separation, which the controller approved. The collision occurred at 2047:59, at an altitude about 300 ft, while flight 5342 was on final approach to land on runway 33 (see figure 1).

[2] Route 1 and Route 4 are standard helicopter routes established by the FAA and were part of PAT25's VFR flight plan. The contours of this route and established compulsory and noncompulsory reporting points are described later in this report.

Figure 1. Google Earth image with preliminary ADS-B flight track for flight 5342 (blue line) and preliminary radar data for PAT25 (orange line).

DCA is equipped with three runways: runway 1/19, runway 15/33, and runway 4/22.[3] In general, when DCA is conducting north operations (as was the case when the collision occurred), traffic lands and departs on runway 1 with intermittent arrivals to runway 33 based on traffic demands and separation requirements. Conducting northbound operations with simultaneous operations to runways 1 and 33 is a routine ATC procedure in compliance with FAA Order 7110.65BB. Use of

[3] Information gathered from FAA data indicated that, between 2018 and 2024, runway 1 accounted for about 57% of arrivals, runway 19 accounted for about 38% of arrivals, runway 33 accounted for about 4% of arrivals, and runway 15 accounted for less than 1% of arrivals at DCA. Runway 15 accounted for about 5% of departures from DCA.

runway 33 is typically limited to smaller aircraft, which are able to land on its relatively shorter surface.[4] Runway 33 is equipped with a four-light precision approach path indicator (PAPI) that uses light cues to provide a 3° glidepath indication to pilots of approaching aircraft. The PAPI was operational at the time of the accident.

PAT25's VFR flight plan entailed transiting Washington, DC, airspace following standard helicopter routes established by the FAA: Route 1 to Route 4. Beginning at the American Legion Bridge near Cabin John, Maryland, Route 1 follows the western shore of the Potomac River before crossing Key Bridge in Washington, DC. Route 1 then follows the eastern shore of the Potomac with the Kennedy Center and Lincoln Memorial to the east and Rosslyn to the west, avoiding prohibited airspace, and crosses Memorial Bridge, a compulsory reporting point (see figure 2).[5] At this point, the maximum allowable altitude on Route 1 is 200 ft above mean sea level (msl).

Route 1 then continues south of the Washington Monument, crossing the Tidal Basin before following the Washington Channel along East Potomac Park. Hains Point, the southernmost tip of East Potomac Park, is identified as a noncompulsory reporting point and the area where Route 4 intercepts Route 1; the maximum altitude on Route 4 remains 200 ft msl.[6] Route 4 continues south toward the Woodrow Wilson Bridge along the Potomac River's eastern shore, with DCA to the west. South of the Wilson Bridge, the maximum allowable altitude along Route 4 increases from 200 ft msl to 300 ft msl.

According to information obtained from FAA aeronautical information specialists, helicopter routes have no defined lateral boundaries and are drawn to depict linear paths along defined surface features in a manner legible to flight crews. Any applicable altitude and lateral distance restrictions are documented in the chart specifications or in warning boxes displayed on the chart. The lateral guidance provided to pilots flying Helicopter Route 4 included, "via east bank of Potomac River"; a specific distance from the river bank was not defined.

[4] The NTSB also learned that some flight crews will specifically request to land on runway 33, which is 5,204 ft long, when wind conditions favor that runway, particularly since its turn-off points are conveniently located nearer to the terminals.

[5] Compulsory reporting points, designated on Helicopter Route Charts by a solid triangle symbol, are geographical locations where pilots must report their position to ATC.

[6] Noncompulsory reporting points are designated by an open triangle symbol on the Helicopter Route Chart. Pilots are not required, but may be requested, to report to ATC upon reaching a noncompulsory reporting point.

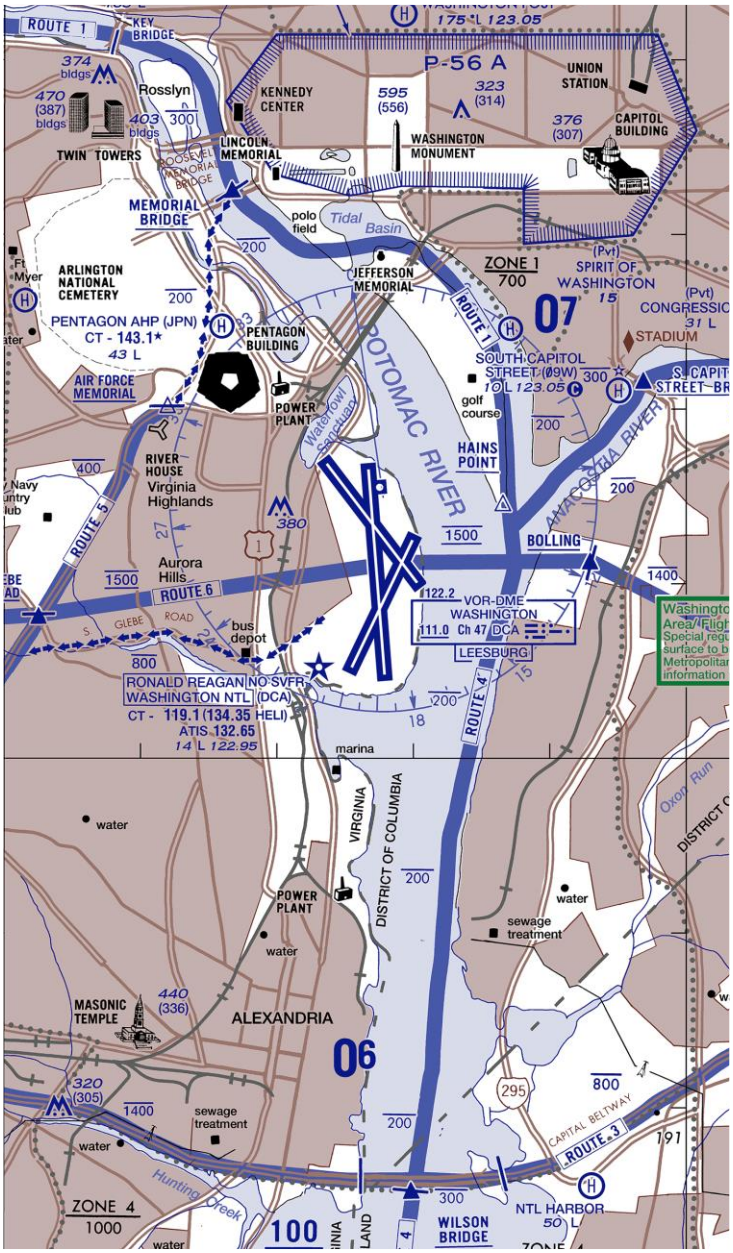

Figure 2. An excerpt of the FAA's Helicopter Route Chart for the area surrounding DCA. Source: FAA.

Figure 3 presents a cross-section of the airspace that extends from runway 33's centerline, spanning from the runway 33 threshold markings to the east bank of the Potomac River. The figure shows the separation distance that would exist, according to FAA charts, with a helicopter on Route 4 and an airplane descending on a 3° visual glideslope (as provided by the PAPI's glidepath indication) to runway 33.

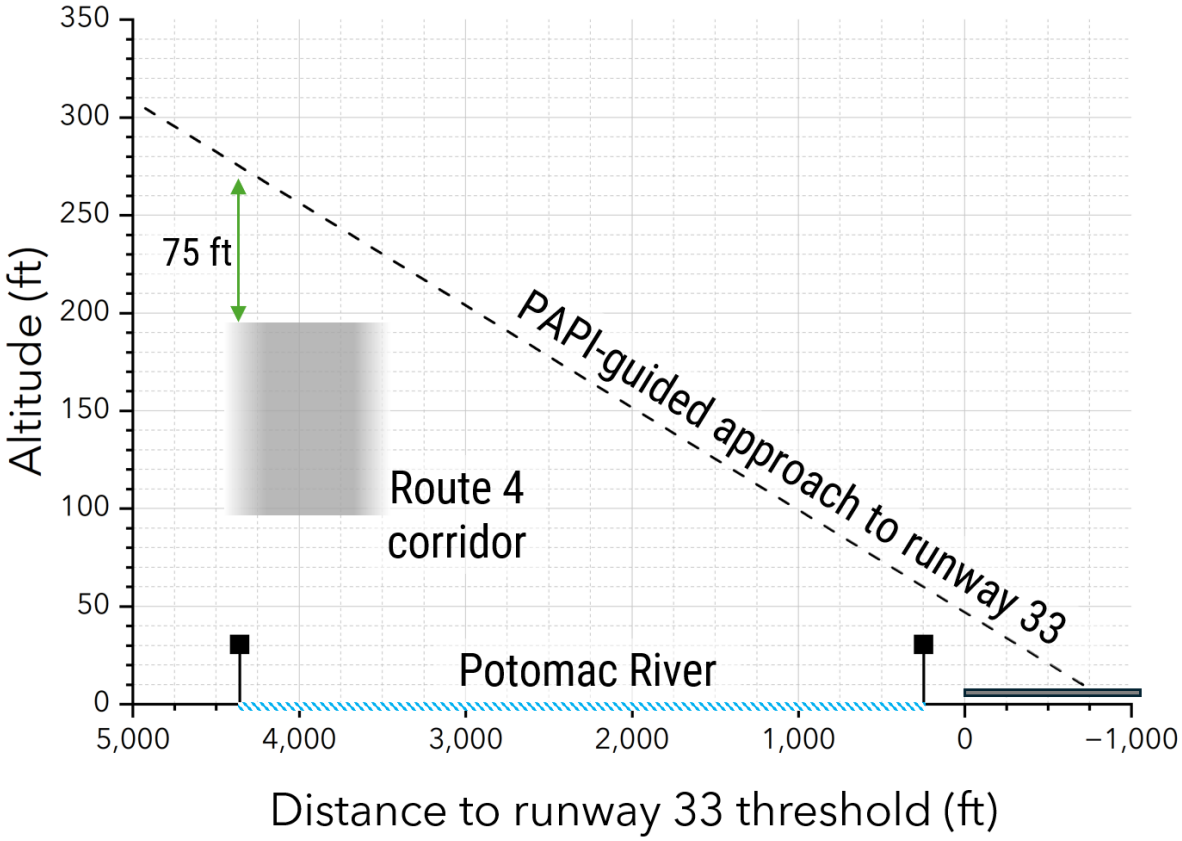

Figure 3. Cross section showing the notional separation between Route 4 and a PAPI-guided visual approach to runway 33, according to FAA charts and aerial photogrammetry analysis.

Because helicopter routes established by the FAA have no lateral boundaries and the Baltimore-Washington Helicopter Route Chart includes no warning for helicopters to operate a defined distance from the shoreline, the shaded region represents an approximation of the area in which helicopters could be flown. At an altitude of 200 ft, a helicopter operating over the eastern shoreline of the Potomac River would have about 75 ft of vertical separation from an airplane approaching runway 33, and this distance decreases if the helicopter is operated farther from the shoreline. This vertical separation also decreases if an airplane is operating below the 3° visual glidepath provided by the runway 33 PAPI.

Review of information gathered from voluntary safety reporting programs along with FAA data regarding encounters between helicopters and commercial aircraft near DCA from 2011 through 2024 indicated that a vast majority of the reported events occurred on approach to landing. Initial analysis found that at least one traffic collision avoidance system (TCAS) resolution advisory was triggered per

month due to proximity to a helicopter.[7] In over half of these instances, the helicopter may have been above the route altitude restriction. Two-thirds of the events occurred at night.

A review of commercial operations at DCA (instrument flight rules departures or arrivals) between October 2021 and December 2024 indicated a total of 944,179 operations. During that time, there were 15,214 occurrences between commercial airplanes and helicopters in which there was a lateral separation distance of less than 1 nm and vertical separation of less than 400 ft. There were 85 recorded events that involved a lateral separation less than 1,500 ft and vertical separation less than 200 ft.

As a result of the January 2025 accident, the FAA issued Notice to Airmen (NOTAM) FDC 5/4379 on February 19, 2025, which restricted helicopter traffic from operating over the Potomac River near DCA from the surface to 17,999 ft msl until March 31, 2025.[8] The NOTAM states that if a lifesaving medical, active law enforcement, active air defense, or presidential transport helicopter mission must operate in this restricted area, civilian aircraft will not be allowed in the area to prevent potential conflicts.

The NTSB's investigation of this accident is ongoing; however, preliminary findings suggest that the existing separation distances between helicopter traffic operating on Route 4 and aircraft landing on runway 33 are insufficient.[9] Therefore, the NTSB concludes that existing separation distances between helicopter traffic operating on Route 4 and aircraft landing on runway 33 are insufficient and pose an intolerable risk to aviation safety by increasing the chances of a midair collision.

Therefore, the NTSB recommends that the FAA prohibit operations on helicopter Route 4 between Hains Point and the Wilson Bridge when runways 15 and 33 are being used for departures and arrivals, respectively, at DCA. As noted

[7] According to FAA publication "Introduction to TCAS II Version 7.1," TCAS is a family of airborne devices that functions independently of the ground-based ATC system and provides collision avoidance protection for a broad spectrum of aircraft types. All TCAS systems provide some degree of collision threat alerting and a traffic display. TCAS II is mandated in the United States by the FAA for commercial aircraft, including regional airline aircraft with more than 30 seats or a maximum takeoff weight of more than 33,000 lbs. TCAS II provides traffic advisories (TAs) to assist the pilot in the visual acquisition of intruder aircraft and resolution advisories (RAs), or recommended escape maneuvers, to either increase or maintain the existing vertical separation between aircraft. On descent below 900 ft above ground level (agl), TCAS inhibits RAs. Below 900 ft agl on descent, TCAS issues a TA when the intruding aircraft is about 20 seconds from the closest point of approach, or 0.3 nm, whichever occurs first. As the aircraft descends below 400 ft agl on arrival, the aural annunciation associated with the TA is inhibited.

[8] This NOTAM replaced 5/9909, which was issued February 4, 2025, and was similar in effect.

[9] That is, the separation distances between Route 4 and runway 33 traffic given the procedures in effect at the time of the accident.

previously, runway 15/33 only accounts for 5% of departures and 4% of arrivals, respectively, so the prohibition of using Route 4 would likely be infrequent, although it could still negatively impact public safety helicopter operations.

The NTSB recognizes that a total closure of helicopter Route 4 between Hains Point and the Wilson Bridge during times when runway 15/33 is in use for departures and arrivals, respectively, would restrict a vital aviation corridor used for law enforcement activity, Coast Guard patrols, and continuity of government operations.[10] Continued access to the most direct course possible is critical for these operations. Additionally, mandating that controllers hold helicopters in place north or south of DCA while airplanes are operating on runway 15/33 has the potential to increase risk by adding to controller workload.

The NTSB concludes that when Route 4 operations are prohibited as recommended in Safety Recommendation A-25-1, it is critical for public safety helicopter operations to have an alternate route for operating in and around Washington, DC, without increasing controller workload. Therefore, the NTSB recommends that the FAA designate an alternative helicopter route that can be used to facilitate travel between Hains Point and the Wilson Bridge when that segment of Route 4 is closed.

Conclusions

Findings

Existing separation distances between helicopter traffic operating on Route 4 and aircraft landing on runway 33 are insufficient and pose an intolerable risk to aviation safety by increasing the chances of a midair collision.

When Route 4 operations are prohibited as recommended in Safety Recommendation A-25-1, it is critical for public safety helicopter operations to have an alternate route for operating in and around Washington, DC, without increasing controller workload.

[10] Medical evacuation flights would not be impacted because they receive priority handling under all circumstances.

Recommendations

To the Federal Aviation Administration:

Prohibit operations on helicopter Route 4 between Hains Point and the Wilson Bridge when runways 15 and 33 are being used for departures and arrivals, respectively, at Ronald Reagan Washington National Airport. (A-25-1) (Urgent)

Designate an alternative helicopter route that can be used to facilitate travel between Hains Point and the Wilson Bridge when that segment of Route 4 is closed. (A-25-2) (Urgent)

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