National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: October 18, 2010

In reply refer to: A-10-124 through -128

The Honorable J. Randolph Babbitt
Administrator
Federal Aviation Administration
Washington, DC 20591

On August 8, 2009, at 1153:14 eastern daylight time, a Piper PA-32R-300 airplane, N71MC, and a Eurocopter AS350BA helicopter, N401LH, operated by Liberty Helicopters, collided over the Hudson River near Hoboken, New Jersey. The pilot and two passengers aboard the airplane and the pilot and five passengers aboard the helicopter were killed, and both aircraft received substantial damage from the impact. The airplane flight was operating under the provisions of 14 *Code of Federal Regulations* (CFR) Part 91, and the helicopter flight was operating under the provisions of 14 CFR Parts 135 and 136. No flight plans were filed or were required for either flight, and visual meteorological conditions prevailed at the time of the accident.

The National Transportation Safety Board (NTSB) determined that the probable cause of this accident was (1) the inherent limitations of the see-and-avoid concept, which made it difficult for the airplane pilot to see the helicopter until the final seconds before the collision, and (2) the Teterboro Airport local controller's nonpertinent telephone conversation, which distracted him from his air traffic control (ATC) duties, including correcting the airplane pilot's read back of the Newark Liberty International Airport (EWR) tower frequency and the timely transfer of communications for the accident airplane to the EWR tower. Contributing to this accident were (1) both pilots' ineffective use of available electronic traffic information to maintain awareness of nearby aircraft, (2) inadequate Federal Aviation Administration (FAA) procedures for transfer of communications among ATC facilities near the Hudson River Class B exclusion area, and (3) FAA regulations that did not provide adequate vertical separation for aircraft operating in the Hudson River Class B exclusion area.[1]

[1] For more information, see *Midair Collision Over Hudson River, Piper PA-32R-300, N71MC, and Eurocopter AS350BA, N401LH, Near Hoboken, New Jersey, August 8, 2009*, Aircraft Accident Report NTSB/AAR-10/05 (Washington, DC: National Transportation Safety Board, 2010), which is available on the NTSB's website at <http://www.ntsb.gov/publictn/2010/AAR1005.pdf>.

Proposed Changes to Hudson River Special Flight Rules Area

The pilot of the accident airplane was conducting a personal flight from Wings Field Airport, Philadelphia, Pennsylvania, to Ocean City Municipal Airport, Ocean City, New Jersey, with a stopover at Teterboro Airport, Teterboro, New Jersey, to pick up a passenger. The pilot of the accident helicopter was conducting a planned 12-minute local sightseeing flight from the West 30th Street Heliport (JRA), New York, New York. At the time of the accident, both aircraft were operating in the Hudson River Class B exclusion area,[2] which provides passage below New York Class B airspace. At that time, the Class B exclusion area extended from the surface of the river to 1,100 feet. The airplane reached an altitude of 1,100 feet about 2 minutes before the collision,[3] and the helicopter had climbed to that altitude when the collision occurred.

On August 27, 2009, the NTSB issued Safety Recommendation A-09-85, which asked the FAA to do the following (as part of the special flight rules area [SFRA][4] procedures requested in Safety Recommendation A-09-84):[5]

> Require vertical separation between helicopters and airplanes by requiring that helicopters operate at a lower altitude than airplanes do, thus minimizing the effect of performance differences between helicopters and airplanes on the ability of pilots to see and avoid other traffic.[6]

On November 30, 2009, the FAA indicated that the agency's November 19, 2009, final rule, "Modification of the New York, NY, Class B Airspace Area; and Establishment of the New York Class B Airspace Hudson River and East River Exclusion Special Flight Rules Area," established, among other things, the following: aircraft overflying the area within the Hudson River exclusion, but not landing at or departing from any of the Manhattan heliports or landing facilities or conducting any local area operations, must transit the Hudson River exclusion at or above an altitude of 1,000 feet up to, but not including, the floor of the overlying Class B airspace (1,300 feet).

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[2] The airplane had a discrete transponder code assigned by ATC, and the airplane pilot was expecting traffic advisories from ATC. The helicopter was using a transponder code of 1200, indicating visual flight rules.

[3] The pilot had been instructed by ATC to maintain an altitude of 1,100 feet or below.

[4] An SFRA comprises airspace with defined vertical and lateral dimensions for which the FAA has established special operational rules and restrictions under 14 CFR Part 93. SFRAs have been established for the area surrounding Los Angeles International Airport, Los Angeles, California, and the Washington, D.C., security zone.

[5] Safety Recommendation A-09-84 asked the FAA to "amend 14 *Code of Federal Regulations* Part 93 to establish [a] special flight rules area (SFRA) including the Hudson River Class B exclusion area, the East River Class B exclusion area, and the area surrounding Ellis Island and the Statue of Liberty; define operational procedures for use within the SFRA; and require that pilots complete specific training on the SFRA requirements before flight within the area." On June 23, 2010, the NTSB classfied the recommedation "Closed—Acceptable Alternate Action."

[6] Along with Safety Recommendations A-09-84 and -85, the NTSB issued three recommendations (A-09-82, -83, and -86) as a result of its preliminary findings for this investigation. For more information about these recommendations, see <http://www.ntsb.gov/Recs/letters/2009/A09_82_86.pdf>.

The final rule does not mandate that aircraft landing at or departing from any of the Manhattan heliports or landing facilities or conducting any local area operations must remain below an altitude of 1,000 feet.[7] The current visual flight rules (VFR) charts for the area (that is, the New York VFR Terminal Area Chart and the New York Helicopter Route Chart) showed no restriction for local traffic to operate below this altitude.

Since that time, five helicopter tour operators in the New York City area, including Liberty Helicopters, began operating new air tour routes in response to concerns of the local community to mitigate the noise heard from helicopter sightseeing flights. According to information provided by Liberty Helicopters, all air tour helicopters depart from the Downtown Manhattan Heliport (JRB) and operate over the Hudson River at altitudes from 300 to 2,000 feet rather than altitudes from 500 to 1,500 feet.

According to Liberty Helicopters' website, the company began operating its helicopter sightseeing flights from JRB in January 2010 because of an agreement to end all air tour flights at JRA in April 2010.[8] (The company's website also indicated that, after April 2010, JRA would only be used for other commercial or government purposes or for emergency takeoffs and landings.) Although the new air tour routes and altitudes were to be reflected in a revised letter of agreement with the LaGuardia Airport (LGA) and EWR ATC towers, Liberty Helicopters' chief pilot stated that the company began flying the new routes and altitudes using the procedures established in the letter of agreement with LGA and EWR dated April 2007. (The revised letter of agreement became effective on August 16, 2010.)

Most of the traffic at JRB will be air tour helicopters operating in the Hudson River Class B exclusion area. However, as indicated on the VFR charts for the area, these air tour helicopters are now required to use the common traffic advisory frequency (CTAF) for the East River exclusion area (123.075) rather than the CTAF for the Hudson River exclusion area (123.05).[9] As a result, pilots of these air tour helicopters will not be monitoring and communicating position reports with other aircraft operating in the Hudson River Class B exclusion area while transmitting on the East River CTAF. The figure shows the location of JRA and JRB and the boundary between the Hudson River and East River CTAFs.

[7] On June 23, 2010, the NTSB stated that the FAA's final rule revising the New York airspace would allow a flight transiting the area to operate at an altitude of 1,000 feet and a local flight in the same area to operate at 999 feet. The NTSB also stated that altitudes used in the Hudson River corridor needed to incorporate a sufficient safety margin to prevent a midair collision and that the revised New York airspace does not provide adequate vertical separation between transiting aircraft and local aircraft. As a result, the NTSB classified Safety Recommendation A-09-85 "Open—Unacceptable Response."

[8] The accident helicopter departed from JRA.

[9] The CTAF allows pilots to exchange traffic information while operating in uncontrolled airspace.

Figure. Location of West 30th Street and Downtown Manhattan Heliports and boundary between Hudson River and East River CTAFs.

The NTSB concludes that pilots operating air tour helicopters to and from JRB may not be fully aware of other aircraft operating over the Hudson River because the CTAF used for such flights is for the adjacent East River area. Therefore, the NTSB recommends that the FAA redefine the boundaries of the East River CTAF so that JRB will be located in the area that uses the Hudson River CTAF.

The NTSB is also concerned that local flights, including those flown according to the new air tour routes, are allowed to operate in the block of airspace from 1,000 to 1,299 feet, which is designated for transiting flights. According to the NTSB's discussions with air tour operators and ATC personnel in the Hudson River area, air tour helicopters will not climb above 900 feet without ATC clearance (as part of a clearance into the overlying Class B airspace); however, there is no published regulatory definition of the airspace structure for local operators or any mandated restriction for local operations to remain below the airspace designated for transiting aircraft.

Further, the vertical separation provision for local operations noted in the FAA's response to Safety Recommendation A-09-85 is not reflected in 14 CFR Part 93, Subpart W, "New York Class B Airspace Hudson River and East River Exclusion Special Flight Rules Area."[10] Subpart W defines local operation in 14 CFR 93.350(a) as follows: "any aircraft within the Hudson River Exclusion [area] that is conducting an operation other than as described in paragraph (b) of this section. Local operations include but are not limited to operations for sightseeing, electronic news gathering [ENG], and law enforcement." Paragraph (b) defines transient operation as an aircraft transiting the entire length of the Hudson River Class B exclusion area from one end to the other. However, 14 CFR 93.352, "Hudson River Exclusion Specific Operating Procedures," mandates the altitudes to be used by aircraft transiting the Hudson River Class B exclusion area (1,000 feet up to, but not including, the floor of the Class B airspace) but does not specify altitudes of operation for aircraft conducting local operations. Thus, according to current regulations, aircraft conducting local operations would not be precluded from operating in the airspace specified for transiting aircraft.

Although 14 CFR Part 93, Subpart W, contains no regulations regarding operating altitudes for local aircraft over the Hudson River, an FAA online training program for the New York SFRA provided this information.[11] The training program described local operations as "flights conducted between the surface and up to, but not including, one thousand feet MSL [mean sea level]." Also, module 3 of the training program, Pilot Operational Procedures, indicated the following: "to ensure your safety and the safety of other aircraft in the area…conduct your entire flight while in the exclusion [area] below 1000 feet MSL."

The NTSB concludes that current FAA regulations do not provide adequate vertical separation for aircraft operating in the Hudson River SFRA because the regulations do not include specific operating altitudes for local aircraft. Therefore, the NTSB recommends that the FAA (1) revise 14 CFR 93.352 to specify altitudes of use for aircraft conducting local operations in the Hudson River SFRA so that the regulation includes required operating altitudes for both local and transiting aircraft and (2) incorporate the altitude information for local operations onto published VFR aeronautical charts for the area.

Guidance on See-and-Avoid Concept

Both aircraft were being operated in a high-density traffic area under the see-and-avoid concept. However, in its report on this accident, the NTSB concluded that the helicopter would not have been obscured from the airplane pilot's view but would likely have been difficult for the pilot to detect until the final seconds before the collision because, before that time, the helicopter would have appeared as a relatively small and stationary object against a complex background of buildings. The NTSB also concluded that the airplane would likely have been in the helicopter pilot's field of view until 32 seconds before the collision, after which time the airplane was above and behind the helicopter and was outside of the pilot's field of view.

[10] Specifically, the FAA's response stated that aircraft landing at or departing from any of the Manhattan heliports or landing facilities or conducting any local area operations must remain below an altitude of 1,000 feet.

[11] This information was obtained from the "New York City Special Flight Rules Area (SFRA)" course on the FAA's website <http://www.faasafety.gov> (accessed July 30, 2010).

FAA Advisory Circular (AC) 90-48C, "Pilots' Role in Collision Avoidance," was issued in March 1983. The AC states that the see-and-avoid concept requires vigilance at all times by each person operating an aircraft regardless of whether the flight is conducted under instrument flight rules or VFR. The AC also notes that most midair collisions and reported near midair collisions occur during good VFR weather conditions and daylight hours. The AC further states that pilots should (1) remain constantly alert to all traffic movement within their field of vision and (2) scan the entire visual field outside of their aircraft to ensure that conflicting traffic can be detected.

Although the guidance in AC 90-48C alerts pilots to the potential hazards of midair and near midair collisions, some of the AC's content is outdated or does not reflect current-day operations. For example, the AC includes guidance on operating within terminal radar service areas, terminal control areas, and airport traffic areas. However, some of these areas were rendered obsolete in 1994 after a reclassification of North American airspace. Also, AC 90-48C describes operational environments in which pilots may find a high volume of traffic, but air tour operational areas are not included in this discussion. In addition, although the AC mentions that pilots should request traffic advisories from ATC to assist with seeing and avoiding other traffic, the AC contains no guidance about technological advances to aircraft equipment that aids in traffic awareness.

The NTSB concludes that the guidance in AC 90-48C could better assist pilots' efforts to establish effective see-and-avoid skills if the AC were to recognize current challenges that pilots encounter in managing their see-and-avoid responsibilities, including complex, high-density airspace and the increasing presence of technology in the cockpit. Therefore, the NTSB recommends that the FAA update AC 90-48C to reflect current-day operations, including (1) a description of the current National Airspace System and airspace classifications, (2) references to air tour operational areas as high-volume traffic environments, and (3) guidance on the use of electronic traffic advisory systems[12] for pilots operating under the see-and-avoid concept.

Electronic Traffic Advisory Systems

There are inherent limitations associated with the see-and-avoid concept as the primary method for aircraft separation. These limitations include a pilot's ability to perform systematic scans,[13] competing operational task demands, environmental factors, and blind spots associated with an aircraft's structure. Traffic advisory systems can provide pilots with additional information to facilitate pilot efforts to maintain awareness of and visual contact with nearby aircraft to reduce the likelihood of a collision.

Most traffic advisory systems have visual displays of nearby traffic that show an aircraft's position or distance, direction of travel, and relative altitude and indicate whether the

[12] The term "traffic advisory system" is used generally rather than specifically throughout this letter.

[13] Although reliably detecting conflicting traffic requires pilots to systematically scan the area around their aircraft while dividing their visual attention among other flight tasks, maintaining a systematic scan while maneuvering can be difficult because of the tendency to look predominantly in the direction of travel.

aircraft is climbing or descending. The accident aircraft were capable of receiving data from the FAA's traffic information service (TIS), which provides pilots of appropriately equipped aircraft[14] with an automatic display of radar-derived traffic information in the cockpit to assist them in visually acquiring nearby aircraft that pose a collision threat. TIS data are uplinked during each radar scan, which occurs about every 5 seconds. TIS provides pilots with the estimated position, relative altitude, altitude trend, and ground track information for a maximum of eight intruder aircraft located within 7 nautical miles (nm) horizontally and +3,500 feet/-3,000 feet vertically.[15] Also, TIS provides an aural and a visual alert to pilots when intruder aircraft are projected to come within a 0.5-nm radius and ± 500 feet of the client aircraft within 34 seconds.

The NTSB's cockpit visibility study for this accident found that (1) the airplane received traffic alerts concerning the helicopter beginning 32 seconds before the collision and (2) the helicopter received traffic alerts concerning the airplane beginning 37 seconds before the collision. The study also indicated the possibility that the airplane received no aural alert concerning the helicopter (because of the design of the TIS system regarding aural alerts)[16] but found that the helicopter likely received aural alerts concerning the airplane about 37 and 28 seconds before the collision. The NTSB could not determine from the available evidence whether either pilot was aware of the TIS alerts, but FAA data showed that TIS data were being transmitted to both aircraft. During postaccident interviews, witnesses to the accident indicated that neither aircraft was maneuvered to avoid the other aircraft; however, a video obtained during the investigation (which was recorded by a ferry boat passenger on the Hudson River) showed that the airplane appeared to roll to the right just before the collision.

The NTSB recognizes that incorporating a visual traffic display into a pilot's scan could increase workload, but any increase in workload would be offset by the safety benefits resulting from the augmented awareness of other aircraft operating in the area, as displayed by the traffic advisory system. However, these safety benefits are not a substitute for the see-and-avoid concept. In fact, Garmin's *GNS 430* and *GNS 530 Pilots Guide and Reference Manual* (dated August and September 2008, respectively) stated that TIS does not relieve pilots of their responsibility to see and avoid other aircraft. Thus, pilots are responsible for paying attention to the position of other aircraft for collision avoidance and not relying solely on a traffic advisory system for aircraft position information.[17]

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[14] To receive TIS data, aircraft must be equipped with an altitude-encoding mode S transponder, a processor with TIS software that is capable of receiving the datalink, and a display for the traffic information. Both accident aircraft were equipped with a Garmin GTX 330 mode S transponder. In the airplane, the transponder was connected to a Garmin GNS 530 navigation and communication system; in the helicopter, the transponder was connected to a Garmin GNS 430 navigation and communication system.

[15] Aircraft without an operating mode A, C, or S transponder cannot be detected by TIS.

[16] An aural alert ("traffic") is generated when the number of traffic alerts (high-priority traffic) displayed on the Garmin GNS units increases between scans. However, it is possible for an aural alert not to sound when an intruder aircraft's status is elevated from a proximity alert (for lower-priority traffic) to a traffic alert or when a new intruder with traffic alert status appears for the first time if, at the same time, an existing traffic alert is downgraded to a proximity alert or an intruder aircraft disappears from the display. For these scenarios, an aural alert would not be generated because the total number of traffic alerts would remain the same.

[17] The Garmin guidance also stated that TIS was not intended to be a collision avoidance system and that avoidance maneuvers were not recommended or authorized as a direct result of a TIS intruder display or alert.

In its report on the July 2007 midair collision involving two ENG helicopters over Phoenix, Arizona, the NTSB found that SkyWatch, the traffic advisory system installed on one of the helicopters, was developed for business and general aviation aircraft, including helicopters, but was not specifically designed according to helicopter flight characteristics.[18] The NTSB's report stated that helicopter flight characteristics require closer range dimensions and closer altitude discrimination because helicopters are more maneuverable and operate at slower speeds than fixed-wing airplanes and that the NTSB was not aware of any traffic advisory systems at the time that met those criteria.[19] The NTSB's report concluded that a traffic advisory system designed specifically for helicopters could help eliminate the nuisance warnings[20] that ENG pilots can receive when other aircraft are operating near the system's alerting envelope and that such systems would enhance an ENG pilot's capability to detect other aircraft operating in the same area.[21] As a result, on February 9, 2009, the NTSB issued Safety Recommendations A-09-04 and -05, which asked the FAA to do the following:

> Develop standards for helicopter cockpit electronic traffic advisory systems so that pilots can be alerted to the presence of other aircraft operating in the same area regardless of their position. (A-09-04)
>
> Once standards for helicopter cockpit electronic traffic advisory systems are developed, as requested in Safety Recommendation A-09-04, require electronic news gathering operators to install this equipment on their aircraft. (A-09-05)

On April 17, 2009, the FAA stated that it would review existing certification standards for electronic traffic advisory systems and determine if additional standards for electronic traffic advisory systems installed on helicopters needed to be developed. The FAA also stated that, if additional standards were needed, they would be developed, and the agency would recommend that all ENG operators install electronic traffic advisory systems on their helicopters.

On August 27, 2009, the NTSB stated that the FAA's plan was responsive to Safety Recommendation A-09-04 but that, to meet the intent of Safety Recommendation A-09-05, the FAA must require electronic traffic advisory systems for ENG helicopters. Safety

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[18] The NTSB notes that TIS was not specifically designed for helicopters and that a traffic advisory system designed for helicopter operations in congested airspace might have provided better information to the helicopter pilot.

[19] Unlike fixed-wing airplanes, helicopters can hover and fly slowly. Also, they are highly maneuverable when operating in a confined airspace and thus can change direction of flight in a short time. As a result, electronic traffic advisory systems designed specifically for fixed-wing airplanes are not necessarily optimal for helicopters operating in a flight regime unique to helicopters.

[20] The NTSB found that, for the accident helicopter that was equipped with SkyWatch, the system's aural alert would frequently sound over the pilot's headset when an aircraft entered a cylinder of airspace that had a 0.2-nm horizontal radius surrounding the pilot's aircraft. The NTSB also found that pilots using SkyWatch would turn down the aural alert during close-in operations because of these nuisance alerts, which obscured the communications frequency.

[21] For more information, see *Midair Collision of Electronic News Gathering Helicopters, KTVK-TV, Eurocopter AS350B2, N613TV, and U.S. Helicopters, Inc., Eurocopter AS350B2, N215TV, Phoenix, Arizona, July 27, 2007*, Aircraft Accident Report NTSB/AAR-09/02 (Washington, DC: National Transportation Safety Board, 2009).

Recommendations A-09-04 and -05 were classified "Open—Acceptable Response," pending the development of standards that address helicopter electronic traffic advisory systems and the establishment of a requirement for all ENG operators to install this equipment on their aircraft.

On May 20, 2010, the FAA responded to Safety Recommendation A-09-04 and stated that it reviewed the current certification standards for electronic traffic advisory systems and determined that technical standard orders (TSO) already existed for these systems.[22] The FAA also stated that the TSOs referenced several RTCA (formerly Radio Technical Commission for Aeronautics) documents that provided minimum operational performance standards and guidance for implementing various traffic advisory systems and displaying traffic information in the cockpit. The FAA further stated that the existing certification standards adequately addressed the issues identified in Safety Recommendation A-09-04 and that no further actions regarding the recommendation were planned.

The NTSB's review of the TSOs found that they described only the minimum standards that all electronic traffic advisory systems must meet to be certified. The TSOs do not address specific standards for helicopter traffic advisory systems, as requested in Safety Recommendation A-09-04, or consider the different types of operations conducted by helicopters. Also, the current standards do not consider the limitations of those helicopter traffic advisory systems that depend on radar systems (such as TIS) to resolve distances that are less than 1/8 nm between aircraft.

In addition, the current certification standards for electronic traffic advisory systems do not consider the potential for nuisance alerts during close-in operations, which can desensitize pilots to system warnings and thus decrease the effectiveness of the systems. When pilots fly closely enough to other aircraft to trigger the traffic alerting function of current traffic advisory systems, the traffic alerts may be disregarded by a pilot if such alerts occur frequently and the pilot is already aware of other aircraft operating in the area. Traffic alerts are triggered based on the assumption that certain parameters (ground track, ground speed, and rate of climb) would be maintained long enough for a traffic advisory system to estimate future positions of the aircraft. This assumption works well for those aircraft that are in stable flight with minimal maneuvering (for example, during en route flight). However, this assumption may not be appropriate when numerous aircraft are maneuvering in a congested VFR corridor (such as the Hudson River Class B exclusion area)[23] or ENG aircraft are maneuvering within a relatively small area.

The NTSB concludes that, because the FAA's current TSOs for electronic traffic advisory systems do not distinguish between the different flight characteristics of helicopters and fixed-wing airplanes, the effectiveness of these systems aboard helicopters is limited. The NTSB further concludes that the traffic alerting function of helicopter electronic traffic advisory systems is limited because the parameters used to trigger alerts do not consider frequent

[22] According to the FAA, these TSOs are for traffic advisory systems (TSO-CI47), traffic collision and avoidance systems (TSO-C118), traffic collision and avoidance systems II (TSO-C119c), and automatic dependent surveillance-broadcast systems (TSO-CI54b and -CI66a).

[23] During a postaccident interview, Liberty Helicopters' director of operations stated that TIS was a useful tool during charter flights along the Hudson River corridor but that it could be distracting during air tour flights while operating in the congested areas of the corridor.

maneuvering in congested areas, resulting in nuisance alerts. Therefore, the NTSB recommends that the FAA develop standards for helicopter cockpit electronic traffic advisory systems that (1) address, among other flight characteristics, the capability of helicopters to hover and to fly near other aircraft at lower altitudes, slower airspeeds, and different attitudes than fixed-wing airplanes; (2) reduce nuisance alerts when nearby aircraft enter the systems' alerting envelope; and (3) consider the different types of operations conducted by helicopters, including those in congested airspace. Further, Safety Recommendation A-09-04 is reclassified "Closed—Unacceptable Action/Superseded," and Safety Recommendation A-10-127 is classified "Open—Unacceptable Response."

In addition, Safety Recommendation A-09-05 focuses solely on helicopter ENG operations, but the use of helicopter electronic traffic advisory systems should be expanded beyond ENG operators to provide passenger revenue operations with the same safety benefit.[24] The NTSB concludes that electronic traffic advisory systems installed on helicopters operated for passenger revenue flight would enhance a pilot's capability to detect other aircraft operating in the same area by providing aural annunciations and visual displays of the traffic. Therefore, the NTSB recommends that, once standards for helicopter electronic traffic advisory systems are developed, as requested in Safety Recommendation A-10-127, the FAA require ENG operators, air tour operators, and other operators of helicopters used for passenger revenue flight to install this equipment on their aircraft. As a result of this new recommendation, Safety Recommendation A-09-05 is reclassified "Closed—Acceptable Action/Superseded."

Therefore, the National Transportation Safety Board recommends that the Federal Aviation Administration:

> Redefine the boundaries of the East River common traffic advisory frequency (CTAF) so that the Downtown Manhattan Heliport will be located in the area that uses the Hudson River CTAF. (A-10-124)
>
> Revise 14 *Code of Federal Regulations* 93.352 to specify altitudes of use for aircraft conducting local operations in the Hudson River special flight rules area so that the regulation includes required operating altitudes for both local and transiting aircraft, and incorporate the altitude information for local operations onto published visual flight rules aeronautical charts for the area. (A-10-125)
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> Update Advisory Circular 90-48C to reflect current-day operations, including (1) a description of the current National Airspace System and airspace classifications, (2) references to air tour operational areas as high-volume traffic environments, and (3) guidance on the use of electronic traffic advisory systems for pilots operating under the see-and-avoid concept. (A-10-126)

[24] This letter does not address electronic traffic advisory systems for airplanes operated under 14 CFR Part 91 because most of these airplanes are privately owned and many may not have an electrical system that can support the operation of a traffic advisory system. Also, Part 91 airplanes may be operated under VFR throughout most of the United States without a transponder. (As previously stated, the accident airplane was capable of receiving TIS data and was equipped with a mode S transponder.)

Develop standards for helicopter cockpit electronic traffic advisory systems that (1) address, among other flight characteristics, the capability of helicopters to hover and to fly near other aircraft at lower altitudes, slower airspeeds, and different attitudes than fixed-wing airplanes; (2) reduce nuisance alerts when nearby aircraft enter the systems' alerting envelope; and (3) consider the different types of operations conducted by helicopters, including those in congested airspace. (A-10-127) (Supersedes Safety Recommendation A-09-04 and is classified "Open—Unacceptable Response")

Once standards for helicopter electronic traffic advisory systems are developed, as requested in Safety Recommendation A-10-127, require electronic news gathering operators, air tour operators, and other operators of helicopters used for passenger revenue flight to install this equipment on their aircraft. (A-10-128) (Supersedes Safety Recommendation A-09-05)

In addition, the National Transportation Safety Board reclassifies the following recommendations to the Federal Aviation Administration:

Safety Recommendation A-09-04 is reclassified "Closed—Unacceptable Action/Superseded." The recommendation is superseded by Safety Recommendation A-10-127.

Safety Recommendation A-09-05 is reclassified "Closed—Acceptable Action/Superseded." The recommendation is superseded by Safety Recommendation A-10-128.

In response to the recommendations in this letter, please refer to Safety Recommendations A-10-124 through -128. If you would like to submit your response electronically rather than in hard copy, you may send it to the following e-mail address: correspondence@ntsb.gov. If your response includes attachments that exceed 5 megabytes, please e-mail us asking for instructions on how to use our Tumbleweed secure mailbox procedures. To avoid confusion, please use only one method of submission (that is, do not submit both an electronic copy and a hard copy of the same response letter).

Chairman HERSMAN, Vice Chairman HART, and Members SUMWALT, ROSEKIND, and WEENER concurred with these recommendations.

[Original Signed]

By: Deborah A.P. Hersman
Chairman