

**REVIEW OF REPORTED NEAR MID-AIR
COLLISIONS IN THE NEW YORK
METROPOLITAN AIRSPACE**

Federal Aviation Administration

Report Number: AV-2008-050

Date Issued: April 24, 2008




Memorandum

**U.S. Department of
Transportation**

Office of the Secretary
of Transportation
Office of Inspector General

Subject: **ACTION:** Review of Reported Near Mid-Air
Collisions in the New York Metropolitan Airspace
Federal Aviation Administration
Report Number AV-2008-050

Date: April 24, 2008

From: David A. Dobbs 
Principal Assistant Inspector General
for Auditing and Evaluation

Reply to
Attn. of: JA-1

To: Acting Federal Aviation Administrator

This report provides the results of our review of reported near mid-air collisions (NMACs) in the New York metropolitan airspace. The review was initiated in response to a June 11, 2007, letter from Senator Hillary Rodham Clinton. In her letter, Senator Clinton expressed concern regarding five reported NMACs involving commercial aircraft in the New York metropolitan airspace during May 2007 and requested that we investigate the incidents. A copy of Senator Clinton's request can be found at exhibit D.

The objectives of our review were to address the following questions posed by Senator Clinton: (1) What is the root cause of the near misses in May 2007 in the New York airspace? (2) How is the Federal Aviation Administration (FAA) addressing these problems and what measures has the FAA taken to prevent repeat occurrences? (3) Do any of the New York area airports practice a similar type of procedure that FAA ordered a halt to at the Memphis airport where FAA allowed planes to simultaneously land and depart from nearby runways that have intersecting flight paths? Additionally, Senator Clinton's staff requested that we determine if air traffic controller staffing may have been a contributing factor to the incidents.

We conducted the review between June 2007 and January 2008. Our scope and methodology can be found at exhibit A. Exhibit B lists the organizations we contacted or visited.

FAA defines a NMAC as “an incident associated with the operation of an aircraft in which a possibility of collision occurs as a result of proximity of less than 500 feet to another aircraft, or a report is received from a pilot or flight crewmember stating that a collision hazard existed between two or more aircraft.”

Only a pilot or flight crew member may report a NMAC. The preliminary report is filed with FAA’s Air Traffic Organization (ATO) and submitted to the Flight Standards line of business. Flight Standards inspectors conduct the NMAC investigation in response to the preliminary NMAC report. They determine the cause and hazard classification and then create the final NMAC report. Flight Standards inspectors classify each NMAC according to the following collision hazards.

- Critical—a collision was barely avoided by chance rather than pilot actions with less than 100 feet separation.
- Potential—a collision was avoided due to pilot action with less than 500 feet separation.
- No Hazard—a collision was improbable regardless of any evasive action taken.

NMAC reports are not reclassified or omitted from the NMAC system, regardless of the final hazard classification. For example, a NMAC report determined by Flight Standards to be “no hazard” remains in the NMAC system, counted and referred to as a “near mid-air collision.”

Four of the five NMAC events in the New York area, during May 2007, involved incidents between commercial aircraft and unidentified general aviation aircraft. In these incidents, the commercial aircraft were operating under instrument flight rules (IFR), and were under direction of controllers at the New York Terminal Radar Approach Control (TRACON) (N90). The unidentified general aviation aircraft were operating under visual flight rules (VFR) and using “see and avoid” techniques, meaning they were not under direction of controllers.

The fifth NMAC event involved two commercial aircraft (one operating under IFR and one operating under VFR); both were under control of the tower at John F. Kennedy International (JFK) Airport.

**Table 1. Five Reported NMACs During May 2007
in New York Airspace**

Date	Facility/NMAC Number	Reporting Aircraft/Flight Rules	2nd Aircraft/Flight Rules	Hazard Classification
5/1/07	N90-003	JetBlue/IFR	Unidentified/VFR	No Hazard
5/5/07	N90-004	JetLink/IFR	Unidentified/VFR	Potential
5/8/07	N90-005	JetBlue/IFR	Unidentified/VFR	No Hazard
5/21/07	N90-006	Continental/IFR	Unidentified/VFR	No Hazard
5/17/07	JFK-001	American Eagle/IFR	US Helicopter/VFR	No Hazard

As shown in table 1, four of the five incidents were classified as no hazard. Only one incident (N90-004) was classified as a potential hazard. This incident involved a glider that did not have a transponder, which provides controllers with data on the location, altitude, speed, and type of aircraft. When the commercial pilot saw the glider directly ahead of him, he initiated an immediate descent to avoid a collision. The 2 aircraft came within approximately 200 feet of each other.

While the other four incidents were determined to be no hazard, they will continue to be classified and counted as a NMAC under FAA's current reporting system for NMACs. In our opinion, the lack of a procedure for reclassifying no-hazard events may contribute to misperceptions regarding the actual safety risk posed by an incident.

RESULTS IN BRIEF

Overall, we found that the five NMACs were independent, unrelated events with no obvious common root causes. Four of the five events were later determined to be no hazards; only one was classified as "potential." These NMACs were reported by commercial IFR pilots who may have been initially "surprised" by the location of the VFR aircraft in nearby airspace, but the incidents actually posed no risk to safety regardless of any actions taken by the pilots. However, the four no-hazard incidents continue to be classified and counted as "near mid-air collisions," a term that we believe misrepresents the actual safety risk posed by an incident.

While we found no common root causes among the five events, there were similar characteristics associated with four of the five NMACs while the aircraft were under direction of controllers at the New York TRACON (NMACs N90 003 though 006). These included the following:

- The type of airspace in which the NMAC occurred—all four events were in airspace that allows both commercial IFR aircraft (under direction of air traffic controllers) and general aviation VFR aircraft (operating under “see and avoid” techniques and not under direction of controllers) to operate simultaneously.
- A change in the type of airspace—three of the four events occurred near the boundary of airspace that is less restrictive (where VFR aircraft are not under direction of controllers), and more restrictive airspace (where commercial aircraft operate under direction of controllers), for aircraft departing from or arriving at New York area airports.
- A change in the controller responsible for directing the aircraft—three of the four events occurred near the time when the responsibility for directing the commercial IFR aircraft was in the process of being “handed off” from one controller to another.

To address vulnerabilities associated with the existing airspace, the current routes used by commercial aircraft over New York would need to be altered or restricted. FAA has an ongoing project to redesign the airspace in the New York/New Jersey/Philadelphia metropolitan areas. The intent of the project is primarily to accommodate growth in aviation operations while enhancing safety and reducing delays.

As part of the review and development of new or revised air traffic procedures implemented under airspace redesign, FAA must evaluate whether commercial IFR arrival and departure routes into and out of the New York metropolitan area should be redesigned or restricted to minimize potential conflicts with general aviation VFR air traffic.

FAA also determined that better Air Traffic services could have been provided by the controllers in two of the four N90 NMACs by alerting the commercial IFR pilots that an unidentified VFR aircraft was in their vicinity. As a result of those events, Air Traffic management issued an Air Traffic Bulletin in September 2007 to remind all controllers of procedures for merging targets and the importance of providing traffic advisories to pilots.

The NMAC at JFK (JFK 001) differed from the other four N90 NMACs as it occurred at the airport near the runway surface. While the incident did not pose a safety risk, FAA took action to prevent a reoccurrence by changing a departure procedure for helicopters. At the time of our site visit, the new departure procedure was only agreed upon verbally between JFK Air Traffic management and that particular helicopter operator. We recommended that JFK formalize the new procedure by amending the existing written Letter of Agreement (LOA) between the helicopter operator and the tower that outlines the standard operating

procedures and coordination actions used by the two parties. In response to our recommendation, FAA and the helicopter operator revised the LOA in November 2007.

None of the five NMACs were the result of a controller operational error (when a controller fails to maintain required separation between two aircraft). In the four N90 NMACs, only the commercial aircraft were under the direction of air traffic controllers at the time of the incidents. The other aircraft involved were operating under VFR. In the NMAC at JFK, the two aircraft were being directed by different controllers; however, in the final NMAC report the inspector determined there was no loss of separation between the two aircraft.

None of the New York metropolitan area airports use an Air Traffic procedure similar to the procedure that FAA discontinued at Memphis International Airport. FAA determined that the former procedure at Memphis (which allowed aircraft to land on a runway while overflying an aircraft that landed on a nearby runway with an intersecting flight path) violated Air Traffic procedures.

While Newark Liberty International Airport does not use that specific procedure, there is an unresolved issue between the New York TRACON and the Newark tower. The issue involves which facility should assume responsibility for staggering arrivals when a certain runway configuration is in use at the airport. FAA should conduct a safety analysis of this runway configuration to identify measures needed to enhance safety and reduce the potential for “go-arounds.”¹ The analysis also should designate responsibility for staggering approaches when that configuration is in use.

Finally, since events determined to be no hazard remain classified as a NMAC, there may be significant misperceptions regarding the proximity and the risk to safety of reported mid-air events. FAA should restructure the existing NMAC reporting process so that the actual safety risks posed by reported events are accurately reflected. Actions to better reflect actual safety risk could include developing a procedure to reclassify no-hazard events, redefining the NMAC criteria, or revising the term “NMAC.”

Our recommendations, listed on page 16, include the following:

¹ A “go around” is when a pilot decides—or a controller instructs an arriving aircraft—to abort its landing and go around for a second attempt.

- Evaluating, as part of the review and development of new or revised air traffic procedures under airspace redesign, whether commercial IFR routes into and out of the New York area should be redesigned or restricted to minimize potential conflicts with VFR air traffic.
- Restructuring the existing NMAC reporting process so that the actual safety risks posed by reported events are accurately reflected.

FAA’s comments and our response are discussed on pages 16 and 17.

FINDINGS

Four of the Five NMACs Had Similar Characteristics

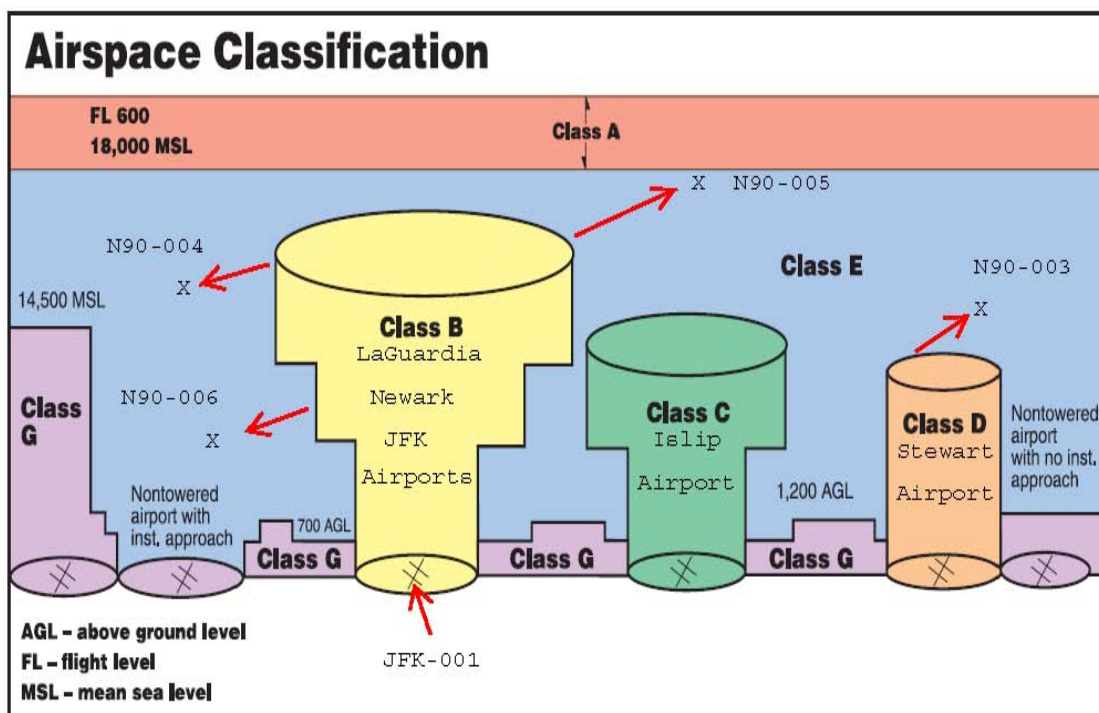
We found that the five NMACs that occurred in May 2007 in the New York metropolitan airspace were independent, unrelated events with no obvious common root causes. However, our review of the four N90 NMACs found three similar characteristics that may have contributed to the events. Those are: (1) the nature of Class E airspace, (2) the proximity to a change in the class of airspace, and (3) the proximity to change of Air Traffic Control responsibility. Table 2 depicts which characteristics were evident in each of the four N90 NMACs.

Table 2. Similar Characteristics of the Four N90 NMACs

Date	Facility & NMAC Number	Nature of Class E Airspace	Proximity to Change of Airspace	Proximity to Transfer of Control
5/1/07	N90-003	Yes	Yes	No
5/5/07	N90-004	Yes	Yes	Yes
5/8/07	N90-005	Yes	No	Yes
5/21/07	N90-006	Yes	Yes	Yes

Airspace is divided into various classes with varying entry requirements. For example, in Class A airspace (high altitude), and Class B, C, and D airspace (near airports), all aircraft must establish two-way communications with Air Traffic Control before entering that airspace. In Class E airspace, however, VFR aircraft can operate *without* establishing communication or receiving direction from Air Traffic Control, and they are responsible for ensuring separation from other aircraft by simply applying “see and avoid” techniques. Class B is the most restrictive airspace while Class E is the least restrictive. Figure 1 represents various classes of airspace in the New York metropolitan area and the locations of the four N90 NMACs and the NMAC at JFK.

Figure 1. Various Classifications of New York Airspace



Note: Not to scale, NMAC locations are not actual representations.

Nature of Class E Airspace

As shown in figure 1, each of the four N90 NMACs occurred in Class E airspace. The four NMACs occurred between a commercial aircraft (operating under IFR and in communication with Air Traffic Control) and an aircraft operating under VFR using “see and avoid” techniques (not in communication with Air Traffic Control). In each event, both aircraft were legally operating in Class E airspace.

Proximity to a Change of Airspace Class

In three of the four N90 NMACs (N90 003, 004, and 006), the incidents occurred near the boundary of Class E airspace and Class B or D airspace where commercial aircraft are departing from or arriving at New York area airports. This may have contributed to the pilots’ “surprise factor,” thus leading to the pilots’ decision to report a NMAC. Commercial pilots leaving one class of airspace and entering another may not maintain an awareness of the transition in airspace and may be surprised when encountering an unidentified VFR aircraft in Class E airspace. Conversely, VFR pilots in Class E are more likely to maintain an awareness of the boundary of Class E airspace, as VFR pilots entering another class of airspace could result in a violation (i.e., a pilot deviation).

Proximity to the Time of a Transfer of Control

For three of the four N90 NMACs (N90 004, 005, and 006), the proximity to a transfer of control was a shared characteristic. These NMACs occurred near the time when the control responsibility for the commercial IFR aircraft was transferred (handed off) from one controller to another.

To adequately address these three issues, the existing airspace used by commercial aircraft over New York would need to be altered. FAA has an ongoing redesign project for the New York/New Jersey/Philadelphia metropolitan airspace. The primary intent of the project is to accommodate growth in aviation operations while enhancing safety and reducing delays. As part of the review and development of new or revised air traffic procedures implemented under airspace redesign, FAA must evaluate whether commercial IFR arrival and departure routes into and out of the New York metropolitan area should be redesigned or restricted to minimize potential conflicts with general aviation VFR air traffic. Further details on the four N90 NMACs follow.

- NMAC N90-003: The controller issued traffic advisories to the pilot and instructed the pilot to turn so that the commercial aircraft would pass behind the unidentified VFR aircraft. This incident occurred in Class E airspace shortly after the IFR aircraft transitioned from Class D to Class E airspace.
- NMAC N90-004: This incident occurred with a glider that did not have a transponder, which provides controllers with data on the location, altitude, speed, and type of aircraft. When the Continental Express pilot saw the glider directly ahead of him and within 200 feet, he initiated an immediate descent to avoid collision with the glider. The pilot stated that a collision would have been imminent had he not taken evasive action.

Since the glider was not visible on radar until the last second, the controller was unable to provide traffic advisories regarding the glider; however, the air route traffic control center controller advised the pilot of glider activity before handing the aircraft off to the New York TRACON.

The FAA inspector responsible for investigating the incident told us that gliders legally operate in the major arrival corridor in Class E airspace for Stewart Airport, John F. Kennedy Airport, La Guardia Airport, Teterboro Airport, and Newark Liberty Airport. The inspector also suggested that the airspace be changed or restricted. This incident occurred in Class E airspace shortly after the IFR aircraft was handed off from one controller to another.

- NMACs N90-005 and N90-006: Both NMACs occurred in Class E airspace near the time when the IFR aircraft were handed off from one controller to another. FAA determined that the controller alerting the pilots of unidentified general aviation aircraft in their vicinities could have provided better Air Traffic Control services (e.g., a traffic advisory). Those actions may have prevented the NMAC by eliminating the pilots' surprise factor. FAA issued an Air Traffic Bulletin in September 2007 to remind controllers of the importance of providing safety alerts and traffic advisories to pilots.

One NMAC Was Unique to Circumstances Related to JFK Airport

The NMAC at JFK (JFK 001) differed from the four N90 NMACs in that it occurred at the airport near the runway surface. The NMAC occurred when a helicopter operated by U.S. Helicopters (operating under VFR) took off from a controlled helipad and made a *right* turn towards runway 13R. The helicopter did not enter or cross runway 13R. Nevertheless, a departing American Eagle pilot (operating under IFR) was surprised by the location of the helicopter and subsequently filed the NMAC. The report investigation revealed, however, that the helicopter had the departing jet in sight and maintained visual separation with that aircraft.

As shown in figures 2 and 3 below, the helipad is behind the terminal; once a helicopter lifts off from the pad, it appears close to runway 13R at the point where some aircraft begin to lift off. Additionally, under the previous procedures used, departing helicopters were not restricted from turning towards runway 13R.

Figure 2. Helicopter Departing Helipad at JFK



Figure 3. Aircraft Departing Runway 13R



A contributing factor to the incident was that the helicopter operation had relocated just 7 days prior to the NMAC from American Airline's terminal on the north side of the airport to Delta's terminal on the south side of the airport; therefore, the pilot may not have been accustomed to seeing a helicopter in the area adjacent to the runway. In addition, the helicopter departure was being controlled by a different controller than the one working the American Eagle departure; therefore, the American Eagle pilots would not have been aware of the departure instructions issued to the helicopter on another frequency.

FAA management at JFK and the helicopter operator agreed to change the helicopter departure procedure to a *left* turn when Runway 13R is in use. We observed the revised helicopter departure procedure in use at JFK and found that it eliminates the potential conflict between departing helicopters and aircraft departing runway 13R.

At the time of our site visit, however, this verbal agreement and the preceding change of helicopter departure location were not formalized in the LOA that exists between JFK Air Traffic management and the helicopter operator. In response to our recommendation to formalize the procedure, FAA and the helicopter operator revised their LOA in November 2007.

None of the NMACs Resulted From Controller Error or Staffing

We also reviewed the five NMACs to determine if controller actions (or inactions) may have contributed to the incident. We found that none of the five NMACs were the result of a controller operational error (when a controller fails to maintain required separation between two aircraft) or staffing levels.

In the four N90 NMACs, only the commercial aircraft were under the direction of air traffic controllers at the time of the incident. The other aircraft involved were operating under VFR and were not being directed by controllers. In the NMAC at JFK, the two aircraft were being directed by different controllers; however, in the final NMAC report the inspector determined that there was no loss of separation between the two aircraft.

While operational errors did not contribute to any of the five NMACs, controller staffing has been a concern for many FAA stakeholders, given the high number of projected controller retirements during the next 10 years. For example, at the New York TRACON, overall staffing (the number of fully certified controllers) decreased by 16 percent, from 213 in October 2001 to 178 in October 2007.

Because of controller staffing concerns, we analyzed controller staffing during the five NMACs to determine whether that issue contributed to the incidents. We determined that controller staffing did not appear to contribute to any of the five NMACs, based on the information shown in table 3.

Table 3. Controller Staffing at the Time of the N90 NMACs

Date	Facility & NMAC Number	Scheduled Staffing	Actual Staffing	Number of Controllers Off Position (Percentage of Staffing for that Shift)	Position Combined?
5/1/07	N90-003	11	12	7 (58 percent)	No
5/5/07	N90-004	13	11	3 (27 percent)	No
5/8/07	N90-005	11	10	4 (40 percent)	No
5/17/07	JFK-001	12	10	5 (50 percent)	No
5/21/07	N90-006	17	16	5 (31 percent)	No

As shown in table 3, the actual staffing (fully certified controllers reporting to work) was slightly less than the scheduled staffing (fully certified controllers scheduled to work) when four of the NMACs occurred. However, between 27 percent and 50 percent of the controllers working that shift were not working an operational position at the time of those events (i.e., they were on meal breaks, in training, etc.). Further, none of the controllers were working combined positions of operation when the NMACs occurred.

We are monitoring FAA's efforts on controller staffing. In a separate audit, we are evaluating FAA's progress in implementing key staffing and training elements of its Controller Workforce Plan. We will report the results of our review in early 2008.

As a result of the August 2006 Comair accident in Lexington, Kentucky, the National Transportation Safety Board (NTSB) identified controller fatigue as a safety concern. NTSB recommended that FAA revise work schedule policies and

practices to provide sufficient controller rest. Because of this recommendation, we reviewed rest periods and shift rotations for controllers working on position during the reported New York NMACs. We determined that controller fatigue did not appear to be a contributing factor to the five NMACs.

**Table 4. Individual Controller Shift Metrics
When the NMACs Occurred**

Date	Facility and NMAC Number	Number of Hours Off Duty Prior to NMAC Shift	Number of Consecutive Minutes Worked at Time of NMAC	Overtime Scheduled Week of NMAC?	Hours of Overtime Worked Week of NMAC
5/1/07	N90-003	39	37	No	0
5/5/07	N90-004	15	67	No	0
5/8/07	N90-005	16	36	No	0
5/17/07	JFK-001	14	56	No	2
5/21/07	N90-006	16	61	No	8

As shown in table 4, all five controllers had rest periods ranging from 14 to 39 hours (a 20-hour average) before the NMAC shift, indicating there was ample time for rest between shifts. Further, the five controllers worked between 36 and 67 consecutive minutes (averaging 51.4 minutes on position) when the NMACs occurred, well below the goal of no more than 2 hours.²

In addition, the five controllers were scheduled for 5-day work weeks with 8-hour shifts and no scheduled overtime (OT) shifts during the week of the NMACs. However, two of the five controllers incurred OT during the week of the NMACs, one of whom worked the OT shift during the portion of the work week prior to the incident. The controller working the position on May 17 during the NMAC at JFK incurred 2 hours of overtime the previous day but was allotted a 14-hour available rest period between the two shifts.

New York Area Airports Do Not Have Standard Operating Procedures Similar to the Simultaneous Arrival Procedure FAA Discontinued at Memphis

Prior to April 2007, controllers at Memphis International Airport used a local standard operating procedure to clear an aircraft to land on a runway while overflying another aircraft that had landed on a separate intersecting runway and was taxiing off the runway.

The Air Traffic Control manual, FAA Order 7110.65, paragraph 3-10-4, Intersecting Runway Separation, establishes Air Traffic procedures for arriving

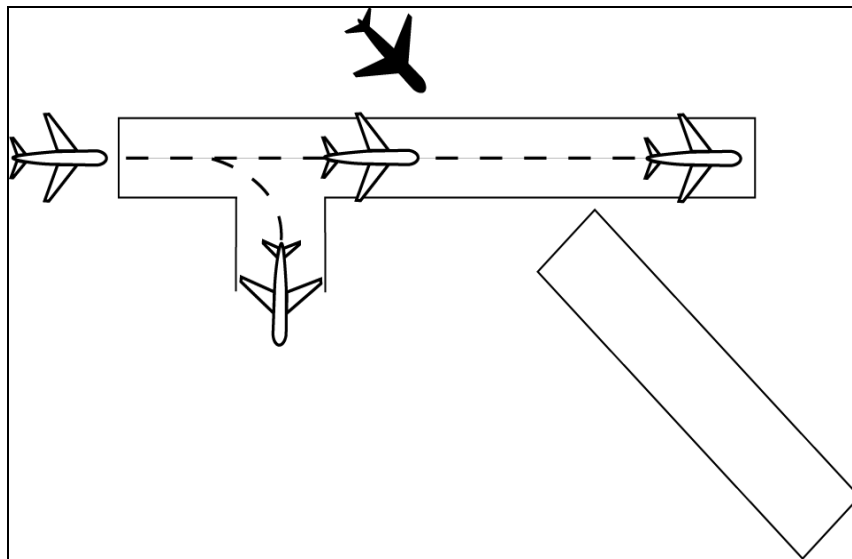
² Per the FAA contract with NATCA, controllers can work a maximum of 2 hours on position before receiving a break.

aircraft with intersecting paths (see figure 4 below). The order requires that Air Traffic:

Separate an arriving aircraft using one runway from another aircraft using an intersecting runway or a nonintersecting runway when the flight paths intersect by ensuring that the arriving aircraft does not cross the landing threshold or flight path of the other aircraft until [a] preceding arriving aircraft is clear of the landing runway, completed landing roll and will hold short of the intersection/flight path, or has passed the intersection/flight path.

This order sets the parameters for ensuring proper runway separation to protect the intersection (or runway flight paths' intersection).

Figure 4. Diagram of Arriving Aircraft With Intersecting Paths



Methods of complying with this requirement include but are not limited to: speed control, spacing techniques, staggering approaches, and use of radar displays to establish cut-off points.

In April 2007, Air Traffic Oversight Services group (part of FAA's Safety line of business) halted the Memphis overflight procedure, citing a violation of FAA Order 7110.65 paragraph 3-10-4. The Oversight Services group determined that to conduct the Memphis procedure, a legitimate waiver for Order 7110.65 paragraph 3-10-4 would be required. The Memphis tower began complying with those requirements, and the Memphis TRACON began using equipment designed to stagger simultaneous arrivals.

We observed operations at JFK, Newark, LaGuardia, and Stewart Air Traffic Control towers and found that none of those conduct an overflight procedure

similar to the procedure discontinued at Memphis. However, we found that there is an unresolved dispute over application of FAA Order 7110.65 paragraph 3-10-4 procedures in regard to arrivals on Runways 22L and 11, when that runway configuration is in use at the airport.

The local National Air Traffic Controllers Association (NATCA) official at Newark tower told us that while controllers apply procedures to comply with those provisions of Order 7110.65 when using the 22L-11 runway configuration, the New York TRACON, which hands off arrivals to Newark, should assume responsibility for staggering simultaneous arrivals to ensure compliance with paragraph 3-10-4. The NATCA official expressed safety concerns about using go-arounds for landing aircraft when this runway configuration is in use.

In another circumstance, officials from the Air Traffic Organization worked with Newark Air Traffic management and on October 5, 2007, FAA's Air Traffic Oversight Services granted a waiver to paragraph 3-10-4 in conducting a specific operation using Runways 4R and 29. Officials from Safety Services stated that this procedure increases safety and reduces go-arounds of landing aircraft.

We met with officials from the Air Traffic Organization, and they agreed to commit resources to conduct a similar review of the Newark Runway 22L and 11 arrival configuration to see what procedures could be implemented to increase safety and reduce go-arounds. Those plans are clearly steps in the right direction; however, the analysis should also designate responsibility for staggering simultaneous arrivals. In addition, local NATCA representatives should be afforded the opportunity to provide input.

FAA's Current Process for Reporting NMACs May Lead to Misperceptions Regarding the Level of Safety Risk Posed by NMAC Events

The lack of a procedure for reclassifying no-hazard events, the term "near mid-air collision," and the definition of a NMAC may contribute to misperceptions regarding the actual safety risk posed by a NMAC event. We found that FAA's current reporting process for NMACs does not allow no-hazard events to be reclassified, which can exaggerate the historical perspective of NMACs. For example, four of the five New York NMACs were subsequently determined to be no hazard, i.e., a collision was improbable regardless of evasive actions taken. However, the four events will continue to be classified and counted as NMACs, potentially masking early recognition of a trend in the highest risk NMACs.

FAA, union, and industry officials we spoke with agreed that the term "near mid-air collision" is misleading. One top airline official stated that the public is misled by the use of this term to describe an event where there was no danger. Since

events determined to be no hazard remain classified as NMACs, aviation users may greatly misunderstand the proximity and the risk to safety of reported NMAC events. For example, in FY 2007, 16 of the 66 total NMACs (or 24 percent), where a collision hazard was identified, were determined to be no-hazard events—yet they are still considered to be NMACs.

FAA's criteria for defining a NMAC also may contribute to misperceptions regarding events where no collision hazard existed. As defined by FAA, a NMAC happens when either an actual collision hazard between two aircraft occurs or when a pilot reports his or her *perception* that a collision hazard existed. Therefore, when the outcome of the NMAC investigation reveals that there was no collision hazard, the reported pilot perception of a collision hazard still meets the near mid-air collision criteria as defined by FAA. The no-hazard event is therefore still classified as a NMAC, and users may erroneously view the event as a collision risk.

FAA must take action to mitigate misperceptions of safety risks posed by a NMAC event. FAA's Director of Air Traffic Safety Oversight Services stated that he would like FAA to review the terminology of all air proximity events, including NMACs, operational errors, and pilot deviations. He also stated that if all proximity events, such as NMACs, remained unclassified until FAA completed an investigation, they could be accurately classified. The ATO Safety Services officials we spoke with concurred that NMAC reporting processes need to be revised.

Accordingly, FAA should restructure the existing NMAC reporting process so that the actual safety risks posed by reported events are accurately reflected. Actions to better reflect actual safety risks could include developing a procedure to reclassify no-hazard events, redefining the NMAC criteria, or revising the term "NMAC."

RECOMMENDATIONS

We recommend that FAA:

1. As part of the review and development of new or revised air traffic procedures under airspace redesign, evaluate whether commercial IFR arrival and departure routes into and out of the New York TRACON's airspace should be redesigned or restricted to minimize potential conflicts with general aviation VFR air traffic.
2. Conduct a safety analysis of the simultaneous arrival procedures at Newark Liberty International Airport when the runway 22L and 11 configuration is in use to identify measures needed to enhance safety and reduce go-arounds. That analysis also should designate responsibility for staggering approaches when that runway configuration is in use.
3. Restructure the existing NMAC reporting process so that the actual safety risks posed by reported events are accurately reflected. Actions to better reflect actual safety risks could include developing a procedure to reclassify no-hazard events, redefining the NMAC criteria, or revising the term "NMAC."

AGENCY COMMENTS AND OFFICE OF INSPECTOR GENERAL RESPONSE

We provided FAA with a draft of this report on January 30, 2008, and received FAA's reply on April 1, 2008. FAA's full response is included in the appendix to this report. FAA concurred with each of our recommendations and provided appropriate planned actions and target dates.

- **Recommendation 1:** FAA stated that as it reviews and develops new or revised air traffic procedures under airspace redesign, it will conduct the recommended evaluation to minimize potential conflicts with general aviation VFR air traffic.
- **Recommendation 2:** FAA stated the ATO Safety office will work with the ATO Terminal office, New York TRACON, and Newark tower to complete an initial safety assessment of the simultaneous arrival procedure at Newark Liberty International Airport by May 1, 2008. The managers of the New York TRACON and the Newark tower are already working this issue, and results of this initial work will be included in the assessment. If the assessment determines that changes are required, the process will be completed by July 1, 2008.

- **Recommendation 3:** FAA stated the ATO Safety office will work with the Air Traffic Safety Oversight office and consult with ATO Systems Operations, ATO Enroute and Oceanic Safety, as well as ATO Terminal Safety to research the history behind the existing NMAC definition and, if appropriate, will initiate the proposed change to the definition. By May 30, 2008, the appropriate groups will meet to determine required changes. No later than October 1, 2008, the appropriate groups will write the change proposal to the definition of a NMAC, request comments from interested parties, and implement the change through the appropriate office.

ACTIONS REQUIRED

FAA's response and planned actions address the intent of our recommendations. We therefore consider these recommendations resolved.

We appreciate the courtesies and cooperation of FAA representatives during this audit. If you have any questions concerning this report, please contact Lou Dixon, Assistant Inspector General for Aviation and Special Program Audits, at (202) 366-0500 or Dan Ravielle, Program Director, at (202) 366-1405.

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cc: FAA Acting Deputy Administrator
Anthony Williams, ABU-100
Martin Gertel, M-1

EXHIBIT A. SCOPE AND METHODOLOGY

We conducted this performance audit in accordance with generally accepted Government Auditing Standards prescribed by the Comptroller General of the United States. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence that provides a reasonable basis for our findings and conclusions based on our audit objectives. We believe the evidence obtained provides a reasonable basis for our findings and conclusion based on our audit objectives. We conducted this review between June 2007 and January 2008 using the following methodology.

To determine the root cause of the near misses in May 2007 in the New York airspace and FAA's measures to address these problems, we visited FAA Headquarters in Washington, D.C., and the New York area air traffic facilities in which the five near misses occurred. These included the New York TRACON and John F. Kennedy, Newark, LaGuardia, and Stewart Airports. We interviewed key FAA officials from the Air Traffic Organization Safety and Terminal Services Offices and the Air Traffic Oversight Services division to discuss possible root causes and the status of any FAA actions. We reviewed FAA's investigation report of the five NMACs to identify any recommended actions.

At each air traffic facility where a NMAC occurred, we interviewed Air Traffic management and union representatives to obtain their view of possible root causes and actions taken at the local level in response to the NMACs. We examined controller staffing, time on position, workload, and work schedules at the time of each incident to determine if staffing or fatigue were contributing factors. We reviewed radar data associated with each incident and analyzed each of the five NMAC preliminary reports. We interviewed Safety Inspectors that investigated the NMACs and reviewed each of five NMAC final investigation reports.

To determine if any of the New York airports allow arriving aircraft to fly directly over aircraft on another runway—a procedure that FAA halted at Memphis Airport in April 2007—we interviewed FAA officials from the Air Traffic Organization Safety Office, Air Traffic Organization Terminal, and the Air Traffic Oversight Services division to obtain a detailed explanation of the halted Memphis procedure and the reason it was halted. We met with Air Line Pilots Association headquarters officials to obtain their concerns regarding the Memphis procedure. We also interviewed management and union representatives and observed the operations at Newark, John F. Kennedy, LaGuardia, and Stewart Airports to determine if a similar procedure was in use.

We did not rely on automated databases as part of this audit.

EXHIBIT B. AGENCIES VISITED OR CONTACTED

- FAA officials from Safety Services and Terminal within the Air Traffic Organization.
- FAA officials from the Air Traffic Safety Oversight Services group within FAA's Safety line of business.
- Air Line Pilots Association, International (ALPA) Headquarters officials in Herndon, VA.
- Facility management and National Air Traffic Controllers Association (NATCA) facility representatives from the New York TRACON (N90), and Kennedy, LaGuardia, and Newark Air Traffic Control towers.
- Facility management from Stewart Air Traffic Control tower.
- Local Flight Standards District Offices (FSDO) representatives responsible for investigating the NMACs.
- JetBlue Headquarters officials (2 of the NMACs were from this airline).
- Continental and Express Jet (Jetlink) airline officials (1 NMAC each from these airlines).
- Program Manager for the New York/New Jersey/Philadelphia metropolitan Area Airspace Redesign.

EXHIBIT C. MAJOR CONTRIBUTORS TO THIS REPORT**THE FOLLOWING INDIVIDUALS CONTRIBUTED TO THIS REPORT.**

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EXHIBIT D. REQUEST FROM SENATOR CLINTON

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June 11, 2007

COMMITTEES:
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ENVIRONMENT AND PUBLIC WORKS
HEALTH, EDUCATION, LABOR, AND PENSIONS
SPECIAL COMMITTEE ON AGING

The Honorable Calvin L. Scovel III
Inspector General
United States Department of Transportation
400 Seventh Street, S.W.
Washington, D.C. 20590

Dear Mr. Scovel:

I write in regard to the disturbing reports that in the month of May, there were five near-misses involving commercial aircraft in the New York metropolitan area. This is especially shocking in light of the fact that there were only three such occurrences in all of 2006.

The New York metropolitan region is the busiest, most complex and compact airspace in the country. There is no room for error. Safe and efficient operations are critical to the traveling public and the economy of the New York metropolitan area. It is imperative that this pattern is corrected before the onset of the busy summer travel season.

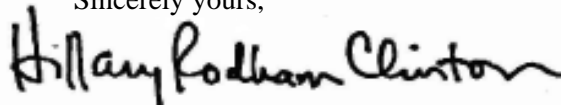
I understand that the Federal Aviation Administration (FAA) has begun its internal investigation; however these incidents call for a broader investigation into the safety of our nation's busiest system and our ability to avoid catastrophic airline collisions. I request that you immediately conduct an investigation into the root causes for these near misses in the New York region and the actions the FAA is taking to resolve these issues.

Specifically, I would ask that your investigation review the following questions:

- What is the root cause of the near misses in May of 2007 in the New York airspace?
- How is the FAA addressing these problems and what measures has the FAA taken to prevent repeat occurrences?
- In April of this year, the FAA ordered a halt to the practice at Memphis International Airport that allowed arriving aircraft to fly directly over planes on another runway that had nearly resulted in a midair collision. Do any of the airports in the New York area practice this type of procedure?

I look forward to your response and thank you for attention to this matter.

Sincerely yours,



Hillary Rodham Clinton

APPENDIX. AGENCY COMMENTS



Federal Aviation Administration

Memorandum

Date: April 1, 2008

To: Lou E. Dixon, Assistant Inspector General for Aviation and Special Program Audits

From: Ramesh K. Punwani, Assistant Administrator for Financial Services/CFO

Prepared by: Anthony Williams, x79000

Subject: OIG Draft Report: Review of Reported Near Mid-Air Collisions in the New York Metropolitan Airspace

Thank you for the opportunity to review and comment on the findings and recommendation of the subject draft report dated January 30. FAA concurs with each of your recommendations and the agency's planned actions for each is as follows:

OIG Recommendation 1: As part of the review and development of new or revised air traffic procedures under airspace redesign, evaluate whether commercial instrument flight rules (IFR) arrival and departure routes into and out of the New York Terminal Radar Approach Control's (TRACON) airspace should be redesigned or restricted to minimize potential conflicts with general aviation visual flight rules (VFR) air traffic.

FAA Response: Concur. As we review and develop new or revised air traffic procedures under airspace redesign, we will conduct the recommended evaluation.

OIG Recommendation 2: Conduct a safety analysis of the simultaneous arrival procedures at Newark Liberty International Airport when the runway 22L and 11 configuration is in use to identify measures needed to enhance safety and reduce go-arounds. That analysis should also designate responsibility for staggering approaches when that runway configuration is in use.

FAA Response: Concur. The Air Traffic Organization (ATO) Safety office will work with ATO-Terminal office, N90 and EWR ATCT to complete an initial Safety assessment. This initial assessment will be completed by May 1 and if further safety analysis is required, the ATO-Terminal office will be asked to complete with whatever assistance from the ATO-Safety office is requested. Although this issue stems from issues other than the original near mid-air collision (NMAC) investigation, we feel that its inclusion in the report is appropriate due to the possibility of go-arounds and missed approaches at the Newark Airport which affects the New York Area Airspace. The Manager of the New York TRACON and the Manager of Newark ATCT are already working this issue and initial work will be included in the assessment. If the assessment determines that changes are required we will encourage that process to be concluded by July 1.

OIG Recommendation 3. Restructure the existing near mid-air collision (NMAC) reporting process so that the actual safety risks posed by reported events are accurately reflected. Actions to better reflect actual safety risk could include developing a procedure to reclassify no-hazard events redefining the NMAC criteria, or revising the term “NMAC.”

FAA Response: Concur. The ATO Safety office will work with the Air Traffic Safety Oversight Office and consult with ATO Systems Operations, ATO-Enroute and Oceanic Safety, as well as ATO-Terminal Safety to research the history behind the existing definition and if appropriate will initiate the Change Proposal. We will meet with the appropriate groups referred to by May 30 and determine the requirements and accept all input. Following May 30, we will write the change proposal, accept all comments and implement through the appropriate office if necessary. Final date will be no later than October 1.

If you have any questions or need further information, please contact Anthony Williams, Budget Policy Division, ABU-100 on (202) 267-9000.

The following pages contain textual versions of the graphs and charts included in this document. These pages were not in the original document but have been added here to accommodate assistive technology.

Review of Reported Near Mid-Air Collisions in the New York Metropolitan Airspace

Section 508 Compliant Presentation

**Table 1. Five Reported Near Mid-Air Collisions (NMAC) During May 2007 in
New York Airspace**

Date of Near Mid-Air Collision (or NMAC)	Facility and NMAC Number	Reporting Aircraft and Flight Rules	Second Aircraft and Flight Rules	Hazard Classification
May 1, 2007	N90-003	Reporting aircraft involved: JetBlue, operating under instrument flight rules	Second aircraft involved: Unidentified aircraft, operating under visual flight rules	No Hazard
May 5, 2007	N90-004	Reporting aircraft involved: JetLink, operating under instrument flight rules	Second aircraft involved: Unidentified aircraft, operating under visual flight rules visual flight rules	Potential
May 8, 2007	N90-005	Reporting aircraft involved: JetBlue, operating under instrument flight rules	Second aircraft involved: Unidentified aircraft, operating under visual flight rules visual flight rules	No Hazard
May 21, 2007	N90-006	Reporting aircraft involved: Continental, operating under instrument flight rules	Second aircraft involved: Unidentified aircraft, operating under visual flight rules visual flight rules	No Hazard
May 17, 2007	JFK-001	Reporting aircraft involved: American Eagle, operating under instrument flight rules	Second aircraft involved: US Helicopter, operating under visual flight rules visual flight rules	No Hazard

Table 2. Similar Characteristics of the Four N90 Near Mid-Air Collisions

Date	Facility and NMAC Number	Nature of Class E Airspace	Proximity to Change of Airspace	Proximity to Transfer of Control
May 1, 2007	N90-003	Nature of Class E Airspace: Yes	Proximity to Change of Airspace: Yes	Proximity to Transfer of Control: No
May 5, 2007	N90-004	Nature of Class E Airspace: Yes	Proximity to Change of Airspace: Yes	Proximity to Transfer of Control: Yes
May 8, 2007	N90-005	Nature of Class E Airspace: Yes	Proximity to Change of Airspace: No	Proximity to Transfer of Control: Yes
May 21, 2007	N90-006	Nature of Class E Airspace: Yes	Proximity to Change of Airspace: Yes	Proximity to Transfer of Control: Yes

Figure 1. Various Classifications of New York Airspace

Picture chart showing the various types of airspace in and around the New York metropolitan area.

Source: FAA

Figure 2. Helicopter Departing Helipad at JFK

Photograph shows a helicopter departing the helipad at JFK airport.

Source: OIG

Figure 3. Aircraft Departing Runway 13R

Photograph of an aircraft taking off from runway 13R which shows the adjacency of the runway to the helipad at JFK.

Source: OIG

Table 3. Controller Staffing at the Time of the N90 Near Mid-Air Collisions

Date	Facility & NMAC Number	Scheduled Staffing	Actual Staffing	Number of Controllers Off Position (Percentage of Staffing for that Shift)	Position Combined?
May 1, 2007	N90-003	Scheduled Staffing: 11	Actual Staffing: 12	Number of Controllers Off Position (Percentage of Staffing for that Shift) 7 (58 percent)	No combined position
May 5, 2007	N90-004	Scheduled Staffing: 13	Actual Staffing: 11	Number of Controllers Off Position (Percentage of Staffing for that Shift) 3 (27 percent)	No combined position
May 8, 2007	N90-005	Scheduled Staffing: 11	Actual Staffing: 10	Number of Controllers Off Position (Percentage of Staffing for that Shift) 4 (40 percent)	No combined position
May 17, 2007	JFK-001	Scheduled Staffing: 12	Actual Staffing: 10	Number of Controllers Off Position (Percentage of Staffing for that Shift) 5 (50 percent)	No combined position
May 21, 2007	N90-006	Scheduled Staffing: 17	Actual Staffing: 16	Number of Controllers Off Position (Percentage of Staffing for that Shift) 5 (31 percent)	No combined position

Table 4. Individual Controller Shift Metrics When the Near Mid-Air Collisions Occurred

Date	Facility and NMAC Number	Number of Hours Off Duty Prior to NMAC Shift	Number of Consecutive Minutes Worked at Time of NMAC	Overtime Scheduled Week of NMAC?	Hours of Overtime Worked Week of NMAC
May 1, 2007	N90-003	Number of Hours Off Duty Prior to NMAC Shift: 39	Number of Consecutive Minutes Worked at Time of NMAC: 37	Overtime Scheduled Week of NMAC? No	Hours of Overtime Worked Week of NMAC: 0
May 5, 2007	N90-004	Number of Hours Off Duty Prior to NMAC Shift: 15	Number of Consecutive Minutes Worked at Time of NMAC: 67	Overtime Scheduled Week of NMAC? No	Hours of Overtime Worked Week of NMAC: 0
May 8, 2007	N90-005	Number of Hours Off Duty Prior to NMAC Shift: 16	Number of Consecutive Minutes Worked at Time of NMAC: 36	Overtime Scheduled Week of NMAC? No	Hours of Overtime Worked Week of NMAC: 0
May 17, 2007	JFK-001	Number of Hours Off Duty Prior to NMAC Shift: 14	Number of Consecutive Minutes Worked at Time of NMAC: 56	Overtime Scheduled Week of NMAC? No	Hours of Overtime Worked Week of NMAC: 2
May 21, 2007	N90-006	Number of Hours Off Duty Prior to NMAC Shift: 16	Number of Consecutive Minutes Worked at Time of NMAC: 61	Overtime Scheduled Week of NMAC? No	Hours of Overtime Worked Week of NMAC: 8

Figure 4. Diagram of Arriving Aircraft With Intersecting Paths

Diagram showing how arriving aircraft can be positioned with intersecting paths.

Source: FAA