NATIONAL TRANSPORTATION SAFETY BOARD
Office of Aviation Safety
Washington, DC 20594

ATC GROUP FACTUAL REPORT

DCA02MA001

A. Aircraft Accident

Location: Belle Harbor, New York

Date: November 12, 2001

Time: 0916 eastern standard time/ 1416 Coordinated Universal Time[1]

Aircraft: American Airlines flight 587, Airbus A300

B. AIR TRAFFIC CONTROL GROUP

Chairman: Mr. Scott J. Dunham
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Washington, D.C. 20594

Mr. Barrett R. Byrnes
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New York, NY.

Mr. Ralph Davis
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Ms. Christine Soucy
Federal Aviation Administration
Washington, DC.

[1]All times are expressed in Coordinated Universal Time (UTC) unless otherwise noted.

C. SUMMARY

On November 12, 2001, at about 1416 UTC, American Airlines flight 587 (AAL587), an Airbus A300 operating under Title 14, Code of Federal Regulations Part 121 as a scheduled passenger flight from John F. Kennedy International Airport (JFK), New York, New York, to Santo Domingo, Dominican Republic, crashed into a residential area of Belle Harbor, New York, shortly after departure. The aircraft and several buildings were destroyed. The two pilots, seven flight attendants, 251 passengers, and five persons on the ground were all fatally injured.

D. DETAILS OF THE INVESTIGATION

The go-team arrived at JFK at 2:30 local time on November 12, 2001. Scott Dunham (ATC group chairman), Abigail Smith, and John O'Callaghan (Aircraft Performance Group chairman) went directly to New York Terminal Radar Approach Control (N90) to obtain recorded radar data on the flight tracks for JFK departures including AAL587. The N90 quality assurance office provided radar data from the Newark, JFK, White Plains, and Islip airport surveillance radar sites, which was retained by Mr. O'callaghan for use by the aircraft performance group.

On November 13, 2001, the ATC group traveled to JFK air traffic control tower (ATCT), reviewed recordings of the ground and local control positions, and collected facility records relevant to the investigation. We also visited the tower cab to view the control positions, airport layout, and geographic area of the accident site. Later that day, the ATC group traveled to N90 to collect background information from the facility and review a replay of radar data from AAL587's flight.

On November 14, 2001, the group interviewed the local controller, ground controller, and controller-in-charge on duty at the time of the accident, reviewed the voice recordings again, and collected further background information from the facility. Following completion of those interviews, the group traveled to N90 to interview the radar departure controller in contact with AAL587 at the time of the accident.

On November 15, 2001, after completion of field notes, the group was released pending further investigative activities.

1. History of Flight

The first contact between air traffic control and AAL587 occurred when the flight crew requested a pre-departure clearance via ARINC data link[2]. The clearance was issued and delivered to the aircraft via datalink at 1231. At 1401:25, the crew contacted JFK ground control to request taxi clearance from the American Airlines terminal area at taxiway TA. The ground controller cleared the crew to taxi to the intersection of taxiway B and taxiway J. The crew read back the clearance. At 1408:58, the ground controller transmitted, "American five eighty seven heavy follow the Japan Air heavy Boeing seven forty seven ahead monitor the tower one one niner point one so long." The crew of AAL587 responded, "follow Japan Air over to tower nineteen one American five eighty seven heavy." There were no further contacts with the aircraft on ground control frequency.

At 1411:37, the local controller transmitted, "American five eighty seven heavy Kennedy tower caution wake turbulence runway three one left taxi into position and hold." The crew acknowledged. At 1413:29, the local controller transmitted, "American five eight seven heavy wind three zero zero at niner runway three one left cleared for takeoff." The crew responded, "cleared for takeoff American ah five eight seven heavy." At 1414:44, local control instructed the crew to, "…fly the bridge climb contact New York departure good morning." The crew acknowledged at 1414:49. There were no further contacts with the aircraft on local control frequency.

At 1415:01, the crew of AAL587 contacted the JFK departure sector of N90, stating, "uh New York American five eighty seven heavy thirteen hundred feet we're climbing to five thousand." The departure controller responded, "American five eight seven heavy New York departure radar contact climb maintain one three thousand." The crew acknowledged. At 1415:37, the departure controller instructed the crew to turn left and proceed direct to WAVEY intersection. At 1415:41, the crew replied, "euh we'll turn direct wavey American five eighty seven heavy." At 1416:00 and 1416:12, there are two periods of noise on the recording. At 1416:49, the departure controller transmitted, "American five eighty seven heavy I'm not receiving your transponder." The controller made several more attempts to contact AAL587, but was unable to obtain a response. At 1418:04, the crew of AAL686, another aircraft that had departed JFK after AAL587, reported seeing a "…tremendous amount of black smoke south of Long Island." The controller acknowledged the report.

At the time of the accident, the official JFK weather as reported in automatic terminal information service[3] (ATIS) information Echo, updated at 1351, indicated that the wind was from 320 degrees at 11 knots, visibility 10 miles, few clouds at 4,300 feet, temperature 6 degrees Celsius, altimeter 30.44. A special observation taken at 1425 and

[2] Aeronautical Radio, Inc., provides data communication services between selected FAA air traffic control towers and various air carriers. One function of this service is to transmit ATC departure clearances to participating flight crews.

[3] ATIS is a continuous broadcast of airport information useful to pilots, and is updated by ATC at least hourly to include the current weather and other data such as runways in use, equipment outages, etc.

transmitted as ATIS information Foxtrot reported that the wind was 280 degrees at 8 knots, visibility 10 miles, few clouds at 4,800 feet, temperature 6 degrees Celsius, altimeter 30.44, smoke plume south.

JFK ATCT Voice Tape and Additional Radar Analysis

The Safety Board requested a copy of the JFK tower ATC voice tape for the entire day of the accident. According to the FAA, the original tape was damaged while being copied. The tape was delivered to the Board broken, and was spliced by Research and Engineering staff.

The Safety Board also requested 24 hours of radio and radar data from the New York TRACON for analysis of departure spacing from major airports in the NY area and comparison to the spacing existing between JAL47 and AAL587. According to N90 records, Japan Airlines flight 47 (JAL47) departed immediately ahead of AAL587. JAL47's assigned beacon code was 1710. AAL587 was assigned code 2650, and AAL686, the next departure, was assigned code 1615. Information obtained from this analysis will be contained in a supplement to this factual report. Specific analysis of the spacing between JAL47 and AAL587 is being conducted by the aircraft performance group.

2. Personnel Interviews

Robert Sadowski **JFK Ground Controller**

Mr. Sadowski began working for the FAA in December of 1975, and was assigned to New York approach control until August 1981. After a break in service, he returned to work for the FAA in 1996 at N90. In April of 1997, Mr. Sadowski was assigned to Morristown, New Jersey Air Traffic Control Tower (ATCT), where he was fully certified and remained until December of 1998, when he reported for duty at JFK ATCT. He is fully certified at JFK, has a control tower operator certificate, and a current medical certificate that expired January 31, 2002.

On the day of the accident, Mr. Sadowski was assigned to work a 0600-1400 local time shift. He actually reported for duty at 0530 local time and left about 1330 local time. This was his fifth shift of a five day workweek. He initially became aware of AAL587 when the crew called for taxi clearance from the AAL terminal. There was nothing unusual about the taxi request. Because the airport was using runway 31L for departure, he instructed AAL587 to taxi out of the ramp area to taxiway J for sequencing into the departure queue. When AAL587 arrived at taxiway J, Mr. Sadowski instructed the crew to follow JAL47 and they did so. As he recalls, there were about 8-10 aircraft waiting to take off. Sequencing of flights in the queue is decided by aircraft type and departure fix. Mr. Sadowski then instructed the crew to monitor tower frequency.

Mr. Sadowski stated that he had a good look at the aircraft during taxi and did not notice

anything unusual. He did not see the aircraft during its takeoff roll or at any point after that. The applicable departure separation standard between AAL587 and the preceding JAL flight was either 4 nm radar separation or two minutes, based on requirements in FAA order 7110.65. When Mr. Sadowski is working local control, he uses the radar spacing standard. He tries to have 4 mile spacing when the second aircraft rotates.

After the accident, he heard the local controller saying something like, "An airplane crashed south of the airport?" It sounded to him like she had heard the information from someone else. Mr. Sadowski is not aware of anyone else in the tower having seen the crash.

Felicia Miller **JFK Local Controller**

Ms. Miller began working for the FAA in May, 1996, at the Palomar ATCT in Carlsbad, California. She became fully certified there and then transferred to JFK ATCT in December of 1998. She is fully certified at JFK. Her control tower operator certificate was received at Hampton University, Hampton, Virginia in October 1993. Her medical certificate expired November 30, 2001.

At the time of the accident, Ms. Miller was working a 0700-1500 local time shift, and actually reported for work at 0635 local time. It was her fourth shift of a five day workweek.

Ms. Miller stated that she was assigned to work the local control and class B airspace positions combined at the time of the accident. She first became aware of AAL587 when she cleared it onto the runway. Aircraft flight strips at the LC position are sequenced by the ground controller as he establishes the departure queue. The local controller identifies the next aircraft by the order of the strips. Ms. Miller cleared AAL587 to taxi into position and hold and issued a wake turbulence advisory because the preceding heavy 747 jet, JAL47, had departed in front of AAL587. Ms. Miller stated that B747s are often slow climbers, so she added some extra separation between JAL47 and AAL587 – more than 4 miles. The minimum separation standard between these two aircraft was 4 NM radar separation or two minutes, and she usually uses the mileage standard. Once the separation was established, Ms. Miller issued the current wind and cleared AAL587 for takeoff. She did watch the aircraft during its takeoff roll, but did not see anything unusual. The last time she saw the aircraft was as it made the left hand turn needed to follow the bridge climb. She then instructed the pilot to contact departure.

Ms. Miller stated that she did look at AAL587's radar target on the tower radar display when AAL686 was cleared for takeoff. AAL587 was two to three miles from the airport at the time, but at least four flying miles away. Her estimate is that AAL587 was about two miles from the NW end of runway 31L, which is almost three miles long. At no time while working AAL587 did she see or hear anything unusual.

Ms. Miller first became aware of the accident when she heard a foreign-sounding voice on the radio saying, "…there's an airplane crashing south of the field." She said, "Say

again?", and the unknown pilot repeated the message. Ms. Miller stated that she then said the same thing out loud in the tower and then everyone turned to look. She did not see the aircraft in the air – she just saw a small black plume of smoke. She does not know if anyone else in the tower saw the aircraft in the air.

When asked if she was aware of any pilot complaints about wake turbulence spacing or separation, Ms. Miller stated that she has heard of pilots asking for extra time before departure for wake turbulence avoidance, but she is not aware of any first-hand complaints about wake turbulence encounters after departure.

Ms. Miller stated that her last observation of a departing aircraft serves two purposes: to visually establish that the aircraft is making the correct departure turn, and that the aircraft's radar data block is tagged up.

She knows that the runway was swept for possible debris after the accident, but it occurred after she was relieved from position.

Based on information obtained about possible witnesses, Ms. Miller was asked about the position of JetBlue 79. She stated that the aircraft may have been holding at taxiway KA awaiting departure. Aircraft at that location would be facing the crash site.

George Fredericks **JFK Controller-in-Charge**

Mr. Fredericks began working for the FAA in December of 1988 as an air traffic assistant. In April 1991, he became an air traffic controller, and after training in Oklahoma City began working at JFK ATCT in August 1991. He is fully certified at JFK ATCT, and his medical certificate was issued on August 23, 2001.

On the day of the accident, Mr. Fredericks was working a 0600-1400 local time shift, and actually reported for duty at 0535 local time. He was assigned to the controller-in-charge position at the time of the accident, and was responsible for general operational supervision, coordination, handling phone calls, making log entries and various other activities in the absence of the tower supervisor. He was not plugged into or monitoring any particular position. He first became aware of the accident when the local controller turned around and stated that there was an airplane crashing south of the airport. Mr. Fredericks almost immediately received a phone call from an outside line asking about an accident south of the airport. He then called N90 on the coordination line to ask if they had lost an aircraft. The N90 controller on the line responded that they were missing AAL587. Mr. Fredericks went to get the flight strip from the local control position, and noticed a large plume of smoke outside. He did not see the aircraft at all before seeing the smoke: not on taxi, takeoff, or departure. Mr. Fredericks is not aware of anyone else in the tower having seen the aircraft crashing.

Mr. Fredericks is not aware of any complaints to the tower about wake turbulence spacing or wake turbulence encounters at any time. He stated that when he is working local control, he watches the radar display to determine when sufficient spacing exists

behind the previous departure. Standards require 4 miles for a heavy jet behind another heavy, 5 miles for a large aircraft behind a heavy jet, or 6 miles for a small aircraft behind a heavy jet. He bases spacing in each case on the distance between the aircraft when the second aircraft rotates. The decision on when to issue takeoff clearance is a judgment call based on a variety of factors and previous experience.

The runway was swept by airport vehicle 99 after the accident.

It was very hectic following the accident, and the tower was receiving numerous phone calls. Mr. Fredericks notified the Port Authority police of the accident, and reported the smoke.

The supervisor was out of the tower at the time of the accident, but returned to the cab almost immediately after it occurred. Mr. Fredericks is not sure when the airport was officially closed, but operations at the airport stopped quickly after the accident. The airport management subsequently announced that the airport would be closed until at least 1700 UTC, but Mr. Fredericks is not sure when the closure actually ended.

Gilbert Waldo **N90 Departure Controller**

Mr. Waldo began working for the FAA on June 11, 1970 at Trenton, New Jersey ATCT. In 1974, he transferred to New York approach control, where he remained until August 1981. After a break in service, he returned to work at N90 in January 1995, and completed certification in January 1996. This was his second shift of a five day workweek, and he was scheduled to work from 0700-1500 local time. He reported for duty at 0630 local time and left about 1300 local time.

Mr. Waldo first became aware of AAL587 when the crew reported on departure frequency leaving 1,300 feet. Mr. Waldo radar identified the aircraft and issued a climb to 13,000 feet. Shortly afterward, he instructed the crew to turn left and proceed direct to WAVEY intersection. Soon afterward, Mr. Waldo noticed that the aircraft's radar target had disappeared, and that the data block was "adrift," no longer showing airspeed or altitude. That was his last contact with the airplane.

There was a JAL B747 that Mr. Waldo believed was about 7 miles ahead of AAL587. The JAL's track was normal, and heading toward GAYLE intersection. AAL686 was the airplane after AAL587. Mr. Waldo gave a climb clearance to AAL686 to 13,000. The pilot of AAL686 reported fire and smoke south of Long Island. After Mr. Waldo lost the target of AAL587, a controller working the flight data position answered a phone call from JFK ATCT asking if N90 had lost any airplanes. Mr. Waldo told the FD controller that he had lost AAL587. The FD controller went to the traffic management unit to notify them of the accident and on the way also ran into Mike Santos (OSIC) Kennedy area. Mr. Waldo was relieved from the position about two minutes after the accident.

Mr. Waldo has heard some previous reports of wake encounters but believes these were "once in a blue moon." He recalled a Saab behind a heavy jet reporting wake turbulence

even though it apparently had adequate spacing.

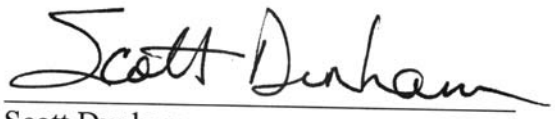
Mr. Waldo said there was nothing unusual about the spacing between handoffs coming to N90 from JFK ATCT that day, and there were no turbulence reports from other aircraft.

Mr. Waldo recalled encountering previous situations where departures were spaced too tightly. He reverted to altitude or vector separation to resolve the problem. Sometimes he also refers such events to a supervisor.

Mr. Waldo said he believed the radio and radar equipment was functioning normally but could not identify the noise he subsequently heard on the tape. "We hear things like that a lot." He thought that noise sounded the same as things he has heard before, and did not really sound unusual.

Mr. Waldo is generally satisfied with the service from JFK. He said it is very rare to have departure spacing problems, and usually it happens only between small aircraft.

Mr. Waldo said that he does not experience pressure to "pack 'em in;" that went out in the 1970's.



Scott Dunham
ATC Group Chairman

Attachments:

From JFK ATCT:
Daily Record of Facility Operations
Position logs
Controller statements
Tower cab layout
Communications transcripts
Airport layout
AAL587 flight strip copy
AAL587 pre-departure clearance data

From N90:
FAA aircraft accident package