
		NTSB ID: DCA02MA001		Aircraft Registration Number: N14053	
		Occurrence Date: 11/12/2001		Most Critical Injury: Fatal	
		Occurrence Type: Accident		Investigated By: NTSB	
Location/Time					
Nearest City/Place Belle Harbor		State NY	Zip Code 11694	Local Time 0916	Time Zone EST
Airport Proximity: Off Airport/Airstrip		Distance From Landing Facility:			
Aircraft Information Summary					
Aircraft Manufacturer Airbus Industrie		Model/Series A300B4-605R		Type of Aircraft Airplane	
Revenue Sightseeing Flight: No			Air Medical Transport Flight: No		
Narrative					
Brief narrative statement of facts, conditions and circumstances pertinent to the accident/incident:					
<p>The Board's full report is available at http://www.nts.gov/publicctn/publicctn.htm.</p> <p>On November 12, 2001, about 0916:15 eastern standard time, American Airlines flight 587, an Airbus Industrie A300-605R, N14053, crashed into a residential area of Belle Harbor, New York, shortly after takeoff from John F. Kennedy International Airport (JFK), Jamaica, New York. Flight 587 was a regularly scheduled passenger flight to Las Americas International Airport, Santo Domingo, Dominican Republic, with 2 flight crewmembers, 7 flight attendants, and 251 passengers aboard the airplane. The airplane's vertical stabilizer and rudder separated in flight and were found in Jamaica Bay, about 1 mile north of the main wreckage site. The airplane's engines subsequently separated in flight and were found several blocks north and east of the main wreckage site. All 260 people aboard the airplane and 5 people on the ground were killed, and the airplane was destroyed by impact forces and a postcrash fire. Flight 587 was operating under the provisions of 14 Code of Federal Regulations (CFR) Part 121 on an instrument flight rules flight plan. Visual meteorological conditions prevailed at the time of the accident.</p> <p>The accident airplane arrived at JFK about 2231 on the night before the accident. The airplane had been flown from San Jose, Costa Rica, to JFK with an intermediate stop in Miami International Airport, Miami, Florida. During postaccident interviews, the pilots of the flight leg from MIA to JFK indicated that the flight was smooth and uneventful.</p> <p>Flight 587 was the first leg of a 1-day roundtrip sequence for the flight crew. American Airlines records indicated that the captain checked in for the flight about 0614 and that the first officer checked in about 0630. The gate agent working the flight arrived at the departure gate about 0645. She stated that the flight attendants were already aboard the airplane at that time and that the captain and the first officer arrived at the gate about 0700.</p> <p>About 0710, the airplane fueling process began. The airplane fueler indicated that, during the fueling process, he saw one of the pilots perform an exterior inspection of the airplane. He finished the fueling process about 0745 and stated that he saw nothing unusual regarding the airplane.</p> <p>Statements provided to the Port Authority of New York and New Jersey Police Department by American Airlines maintenance and avionics personnel indicated that, sometime between 0730 and 0800, the captain reported that the number 2 pitch trim and yaw damper system would not engage. Two avionics technicians were sent to the airplane to investigate the problem. They performed an auto flight system (AFS) check, which indicated a fault with the number 2 flight augmentation computer. The circuit breaker was then reset, another AFS check was performed, and no fault was detected. In</p>					
FACTUAL REPORT - AVIATION					
					Page 1

 <p>National Transportation Safety Board FACTUAL REPORT AVIATION</p>	NTSB ID: DCA02MA001
	Occurrence Date: 11/12/2001
	Occurrence Type: Accident

Narrative (Continued)

addition, an autoland system check was performed, and that test also did not detect a fault. The avionics technicians estimated that they were in the cockpit for 5 to 7 minutes.

The cockpit voice recorder (CVR) recording began about 0845:35. The CVR indicated that, about 0859:58, the airplane was cleared to push back from the gate. About 0901:33, the ground controller provided the flight crew with taxi instructions to runway 31L, and the first officer acknowledged these instructions. About 0902:05, the captain told the first officer, "your leg, you check the rudders." (The first officer was the flying pilot, and the captain was the nonflying pilot.) Data from the flight data recorder (FDR) showed that, about 0902:07, the rudder pedal check began. The FDR data also showed that a maximum right rudder pedal deflection of about 3.7 inches was recorded about 0902:11 and that a maximum left rudder pedal deflection of 3.6 inches was recorded about 0902:19. About 0902:23, the first officer responded, "rudders check." The FDR data showed that the rudder pedals returned to their neutral position about 0902:25.

About 0906:53, the ground controller provided the pilots of Japan Air Lines flight 47, a Boeing 747-400, with taxi instructions to runway 31L. About 0908:01, the ground controller instructed the Japan Air Lines pilots to contact the local (tower) controller. About 0908:58, the ground controller instructed the flight 587 pilots to follow the Japan Air Lines airplane and to contact the local controller. The first officer acknowledged this instruction.

About 0911:08, the local controller cleared the Japan Air Lines airplane for takeoff. About 0911:36, the local controller cautioned the flight 587 pilots about wake turbulence and instructed the pilots to taxi into position and hold for runway 31L. The first officer acknowledged the instruction. About 0913:05, the local controller instructed the Japan Air Lines pilots to fly the bridge climb and to contact the departure controller at the New York Terminal Radar Approach Control (TRACON). About 0913:21, the flight 587 captain said to the first officer, "you have the airplane."

About 0913:28, the local controller cleared flight 587 for takeoff, and the captain acknowledged the clearance. About 0913:35, the first officer asked the captain, "you happy with that [separation] distance?" About 3 seconds later, the captain replied, "we'll be all right once we get rollin'. He's supposed to be five miles by the time we're airborne, that's the idea." About 0913:46, the first officer said, "so you're happy."

The National Transportation Safety Board's airplane performance study for this accident determined that flight 587 started its takeoff roll about 0913:51 and lifted off about 0914:29, which was about 1 minute 40 seconds after the Japan Air Lines airplane. About 0914:43, the local controller instructed the flight 587 pilots to turn left, fly the bridge climb, and contact the New York TRACON departure controller. About 5 seconds later, the captain acknowledged this instruction. Radar data indicated that the airplane climbed to 500 feet above mean sea level (msl) and then entered a climbing left turn to a heading of 220°. About 0915:00, the captain made initial contact with the departure controller, informing him that the airplane was at 1,300 feet msl and climbing to 5,000 feet msl. About 0915:05, the departure controller instructed flight 587 to climb to and maintain 13,000 feet msl, and the captain acknowledged this instruction about 5 seconds later. About 0915:29, the CVR recorded the captain's statement "clean machine," indicating that the gear, flaps, and slats had all been retracted.

About 0915:35, flight 587 was climbing through 1,700 feet msl with its wings approximately level. About 1 second later, the departure controller instructed flight 587 to turn left and proceed direct to the WAVEY navigation intersection (located about 30 miles southeast of JFK). About 0915:41, the captain acknowledged the instruction. The controller did not receive any further transmissions from flight 587.

FDR data indicated that, about 0915:36, the airplane experienced a 0.04 G drop in longitudinal load factor, a 0.07 G shift to the left in lateral load factor, and about a 0.3 G drop in normal

National Transportation Safety Board

FACTUAL REPORT

AVIATION

NTSB ID: DCA02MA001

Occurrence Date: 11/12/2001

Occurrence Type: Accident

Narrative (Continued)

(vertical) load factor. The airplane performance study found that these excursions were consistent with a wake turbulence encounter. Between 0915:36 and 0915:41, the FDR recorded movement of the control column, control wheel, and rudder pedals. Specifically, the control column moved from approximately 0° (neutral) to 2° nose up, 2° nose down, and back to 0°; the control wheel moved a total of seven times, with peaks at 18° right, 30° left, 37° right, 34° left, 5° left, 21° left, and 23° right, before moving to between 5° and 6° left; and the rudder pedals moved from about 0.1 inch left (the starting point for the pedals) to about 0.1 inch right and 0.2 inch left before moving to 0.1 inch left. The airplane performance study indicated that, during this time, the rudder moved from 0° (neutral) to about 2° left, about 0.6° right, and back to 0°.

During the wake turbulence encounter, the airplane's pitch angle increased from 9° to 11.5°, decreased to about 10°, and increased again to 11°. The airplane's bank angle moved from 0° (wings level) to 17° left wing down, which was consistent with the turn to the WAVEY navigation intersection.

At 0915:44.7, the captain stated, "little wake turbulence, huh?" to which the first officer replied, at 0915:45.6, "yeah." At 0915:48.2, the first officer indicated that he wanted the airspeed set to 250 knots, which was the maximum speed for flight below 10,000 feet msl. At that point, the airplane was at an altitude of about 2,300 feet msl.

FDR data indicated that, about 0915:51, the load factors began excursions that were similar to those that occurred about 0915:36: the longitudinal load factor dropped from 0.20 to 0.14 G, the lateral load factor shifted 0.05 G to the left, and the normal load factor dropped from 1.0 to 0.6 G. The airplane performance study found that these excursions were also consistent with a wake turbulence encounter. According to the FDR, the airplane's bank angle moved from 23° to 25° left wing down at 0915:51.5, the control wheel moved to 64° right at 0915:51.5, and the rudder pedals moved to 1.7 inches right at 0915:51.9.

At 0915:51.8, 0915:52.3, and 0915:52.9, the CVR recorded the sound of a thump, a click, and two thumps, respectively. At 0915:54.2, the first officer stated, in a strained voice, "max power." At that point, the airplane was traveling at 240 knots. About 0915:55, the captain asked, "you all right?" to which the first officer replied, "yeah, I'm fine." One second later, the captain stated, "hang onto it. Hang onto it." The CVR recorded the sound of a snap at 0915:56.6, the first officer's statement "let's go for power please" at 0915:57.5, and the sound of a loud thump at 0915:57.7. According to the airplane performance study, the vertical stabilizer's right rear main attachment fitting fractured at 0915:58.4, and the vertical stabilizer separated from the airplane immediately afterward. At 0915:58.5, the CVR recorded the sound of a loud bang. At that time, the airplane was traveling at an airspeed of about 251 knots.

According to the FDR, the rudder pedals moved from 1.7 inches right to 1.7 inches left, 1.7 inches right, 2.0 inches right, 2.4 inches left, and 1.3 inches right between 0915:52 and 0915:58.5. Also, the FDR showed that the control wheel moved 64° to the right at 0915:51.5, 78° (full) to the left at 0915:53.5, 64° to the right at 0915:55.5, and 78° to the left at 0915:56.5.

The airplane performance study estimated that, at 0915:53.2, the rudder was deflected 11° to the left, and the sideslip angle at the airplane's center of gravity (cg) was about 4° to the left (after peaking temporarily at 5° to the left).²¹ At 0915:56.8, the rudder was deflected 10.2° to the left, and the sideslip angle was about 7° to the left. At 0915:58.4 (the time that the right rear main attachment fitting fractured), the rudder was deflected between 10° and 11° to the right, the sideslip angle was between 11° and 12° to the right, and the airplane experienced a 0.2 G shift to the right in lateral load factor.

The CVR recorded, at 0916:00.0, a sound similar to a grunt and, 1 second later, the first officer's statement, "holy [expletive]." At 0916:04.4, the CVR recorded a sound similar to a stall warning repetitive chime, which lasted for 1.9 seconds. At 0916:07.5, the first officer stated, "what the

National Transportation Safety Board

FACTUAL REPORT

AVIATION




NTSB ID: DCA02MA001


Occurrence Date: 11/12/2001

Occurrence Type: Accident

Narrative (Continued)

hell are we into...we're stuck in it." At 0916:12.8, the captain stated, "get out of it, get out of it." The CVR recording ended 2 seconds later. The airplane was located at 40° 34' 37.59" north latitude and 73° 51' 01.31" west longitude. The accident occurred during the hours of daylight.

 National Transportation Safety Board FACTUAL REPORT AVIATION		NTSB ID: DCA02MA001			
		Occurrence Date: 11/12/2001			
		Occurrence Type: Accident			
Landing Facility/Approach Information					
Airport Name	Airport ID:	Airport Elevation	Runway Used	Runway Length	Runway Width
John F. Kennedy International	JFK	Ft. MSL	NA		
Runway Surface Type:					
Runway Surface Condition:					
Approach/Arrival Flown: NONE					
VFR Approach/Landing: None					
Aircraft Information					
Aircraft Manufacturer		Model/Series		Serial Number	
Airbus Industrie		A300B4-605R		420	
Airworthiness Certificate(s): Transport					
Landing Gear Type: Tricycle					
Amateur Built Acft? No	Number of Seats: 266	Certified Max Gross Wt.	353500 LBS	Number of Engines: 2	
Engine Type:	Engine Manufacturer:	Model/Series:	Rated Power:		
Turbo Fan	General Electric	CF6	59000 LBS		
- Aircraft Inspection Information					
Type of Last Inspection	Date of Last Inspection	Time Since Last Inspection	Airframe Total Time		
Continuous Airworthiness		Hours	37550 Hours		
- Emergency Locator Transmitter (ELT) Information					
ELT Installed?/Type No	ELT Operated? No	ELT Aided in Locating Accident Site? No			
Owner/Operator Information					
Registered Aircraft Owner		Street Address			
AMERICAN AIRLINES INC		4333 Amon Carter Blvd.			
		City	State	Zip Code	
		Fort Worth	TX	76155	
Operator of Aircraft		Street Address			
AMERICAN AIRLINES INC					
		City	State	Zip Code	
			TX		
Operator Does Business As:			Operator Designator Code: AALR		
- Type of U.S. Certificate(s) Held:					
Air Carrier Operating Certificate(s): Flag Carrier/Domestic					
Operating Certificate:			Operator Certificate:		
Regulation Flight Conducted Under: Part 121: Air Carrier					
Type of Flight Operation Conducted: Scheduled; International; Passenger Only					
FACTUAL REPORT - AVIATION					
Page 2					

 <p>National Transportation Safety Board FACTUAL REPORT AVIATION</p>	NTSB ID: DCA02MA001
	Occurrence Date: 11/12/2001
	Occurrence Type: Accident

First Pilot Information

Name	City	State	Date of Birth	Age 42
------	------	-------	---------------	-----------

Sex: M	Seat Occupied: Left	Occupational Pilot? <input type="checkbox"/> Civilian Pilot <input type="checkbox"/>	Certificate Number:
--------	---------------------	--	---------------------

Certificate(s): Airline Transport

Airplane Rating(s): Multi-engine Land

Rotorcraft/Glider/LTA: None

Instrument Rating(s): Airplane

Instructor Rating(s): None

Current Biennial Flight Review? 07/2001

Medical Cert.: Class 1	Medical Cert. Status: Valid Medical--no waivers/lim.	Date of Last Medical Exam: 06/2001
------------------------	--	------------------------------------

- Flight Time Matrix	All A/C	This Make and Model	Airplane Single Engine	Airplane Multi-Engine	Night	Instrument		Rotorcraft	Glider	Lighter Than Air
						Actual	Simulated			
Total Time	8050									
Pilot In Command(PIC)	3448	1723								
Instructor										
Instruction Received										
Last 90 Days	146									
Last 30 Days	52									
Last 24 Hours										

Seatbelt Used? Yes	Shoulder Harness Used? No	Toxicology Performed? Yes	Second Pilot? Yes
--------------------	---------------------------	---------------------------	-------------------

Flight Plan/Itinerary

Type of Flight Plan Filed: IFR

Departure Point	State	Airport Identifier	Departure Time	Time Zone
New York City	NY	KJFK	0914	EST

Destination	State	Airport Identifier	
Santo Domingo		KSDQ	


Type of Clearance: IFR

Type of Airspace: Class A

Weather Information

Source of Wx Information:

Company

 <p>National Transportation Safety Board FACTUAL REPORT AVIATION</p>	NTSB ID: DCA02MA001
	Occurrence Date: 11/12/2001
	Occurrence Type: Accident

Weather Information

WOF ID	Observation Time	Time Zone	WOF Elevation	WOF Distance From Accident Site	Direction From Accident Site
JFK	0925	EST	Ft. MSL	NM	Deg. Mag.

Sky/Lowest Cloud Condition: Few	4800 Ft. AGL	Condition of Light: Day
---------------------------------	--------------	-------------------------

Lowest Ceiling: None	Ft. AGL	Visibility: 10	SM	Altimeter: 30.44	"Hg
----------------------	---------	----------------	----	------------------	-----

Temperature: 6 °C	Dew Point: -6 °C	Weather Conditions at Accident Site: Visual Conditions
-------------------	------------------	--

Wind Direction: 270	Wind Speed: 8	Wind Gusts:
---------------------	---------------	-------------

Visibility (RVR):	Ft.	Visibility (RVV)	SM
-------------------	-----	------------------	----

Precip and/or Obscuration:

Accident Information

Aircraft Damage: Destroyed	Aircraft Fire: Ground	Aircraft Explosion: Ground
----------------------------	-----------------------	----------------------------

- Injury Summary Matrix	Fatal	Serious	Minor	None	TOTAL
First Pilot	1				1
Second Pilot	1				1
Student Pilot					
Flight Instructor					
Check Pilot					
Flight Engineer					
Cabin Attendants	7				7
Other Crew					
Passengers	251				251
- TOTAL ABOARD -	260				260
Other Ground	5				5
- GRAND TOTAL -	265				265

National Transportation Safety Board

FACTUAL REPORT

AVIATION



NTSB ID: DCA02MA001

Occurrence Date: 11/12/2001

Occurrence Type: Accident

Administrative Information

Investigator-In-Charge (IIC)

Robert Benzon

Additional Persons Participating in This Accident/Incident Investigation:

TR Proven
Federal Aviation Administration
Washington, DC