



National Transportation Safety Board Aviation Accident Final Report

Location:	Boston, MA	Accident Number:	NYC01LA166
Date & Time:	07/08/2001, 1214 EDT	Registration:	N760EA
Aircraft:	Cessna 402C	Aircraft Damage:	Destroyed
Defining Event:		Injuries:	1 Minor

Flight Conducted Under: Part 91: General Aviation - Positioning

Analysis

The pilot accepted an intersection departure and waived the wake turbulence holding time. A Boeing 737-300 departed ahead of him, and according to pilot, the Boeing's nosewheel lifted off the runway just as it passed him. The pilot also noted that the Boeing and its exhaust smoke drifted to the left of the runway's centerline. A wake turbulence advisory and takeoff clearance were issued by the tower controller and acknowledged by the pilot. The pilot initiated the takeoff, and after liftoff, the left wing dropped. It contacted the runway, and the airplane rolled inverted. The airplane then slid off the left side of the runway and a post-crash fire developed.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's improper decision to waive the wake turbulence hold time, and his subsequent loss of control when wake vortex turbulence was encountered.

Findings

Occurrence #1: VORTEX TURBULENCE ENCOUNTERED
Phase of Operation: TAKEOFF - INITIAL CLIMB

Findings

1. (C) PLANNING/DECISION - IMPROPER - PILOT IN COMMAND
2. (C) AIRCRAFT CONTROL - NOT MAINTAINED - PILOT IN COMMAND

Occurrence #2: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

Factual Information

On July 8, 2001, at 1214 eastern daylight time, a Cessna 402C, N760EA, operated by Cape Air as flight 65, was destroyed when it struck the runway after takeoff from Logan International Airport (BOS), Boston, Massachusetts. The certificated airline transport pilot received minor injuries. Visual meteorological conditions prevailed for the positioning flight destined for Nantucket, Massachusetts. Flight 65 was operated on an instrument flight rules (IFR) flight plan under 14 CFR Part 91.

According to an inspector from the Federal Aviation Administration (FAA), the departure procedure at Boston was to listen to the ATIS, contact departure control for departure clearance, then monitor ground control and wait to be called. The pilot did this and at 1208, the pilot was contacted by the ground controller who said:

"cair sixty five, boston ground, taxi to runway two two right, intersection departure at fifteen right, via kilo, november, fifteen right, there will be a wake turbulence delay."

The pilot replied:

"fifteen right, we're going kilo, november, we'll ah, we'll go ahead and waive the non heavy, sixty five."

As the airplane neared the departure point, the ground controller instructed the pilot to monitor the control tower.

At 1212:45, US Airways flight 677, was cleared for takeoff on runway 22R. The flight crew acknowledged the clearance at 1212:50.

At 1213:23, the local controller transmitted:

"cair sixty five, boston, caution wake turbulence preceding full length departure was a seven thirty seven, traffic holding full length, turn right into position, runway two two right from one five left, cleared for takeoff." The pilot replied, "we're cleared to go from one five right, cair sixty five thanks.", after which the local controller repeated the takeoff clearance.

At 1214:11, an unknown person said, "what happened there", and at 1214:13, an unknown person said, "better roll the crash crew", to which the local controller replied, "we got it going."

A witness was taxiing north on taxiway KILO, approaching taxiway CHARLIE. He first observed the airplane just after it became airborne, and its landing gear was retracting. He said the airplane was in a shallow climb. He thought the airplane had reached an altitude of 30 feet when it entered a left turn with an "abrupt left roll." The angle of bank continued to increase, and as the airplane rolled past about 110 degrees, the left wing contacted the runway. The airplane continued to roll over on its back with the nose and vertical stabilizer striking the runway. The airplane then slid off the runway into the grass, pivoted on the left wing, then came to rest and caught on fire.

Emergency personnel responded to the accident site and extinguished the fire. The pilot, who was able to exit the airplane without assistance, was treated by emergency personnel at the site, and then taken to a local hospital.

The airplane that departed just prior to the accident was a Boeing 737-300, with a takeoff weight of 118,635 pounds. The pilot had used a 5-degree flap setting for takeoff, and he estimated that the airplane used about 5,000 feet of runway to become airborne.

The accident pilot reported that he thought the nosewheel from the preceding airplane was lifting off as the airplane passed by his position. He could see exhaust smoke, and noticed that both the airplane and the exhaust smoke had drifted to the left of the runway centerline at the time of his departure.

The pilot further stated that the airplane's ground roll was about 1,500 feet, and after liftoff, with a positive rate of climb, he initiated landing gear retraction. Passing through 50 to 100 feet above the runway, he felt a wobble, and the left wing dropped about 90 degrees. The airplane assumed a nose down attitude, struck the runway, and rolled inverted. The airplane slid into the grass area and stopped, then a fire developed. The pilot reported that he was able to exit through the cabin door.

When asked, the pilot reported that he had encountered wake turbulence and there were no problems with either the airplane or the engines.

The Director of Flight Operations for Cape Air reported that at Boston, when using runway 22R for departure, it was common to make an intersection departure from runway 15.

Runway 22 was 7,860 feet long. The centerline of runway 15 crossed runway 22 about 3,885 feet from runway 22's departure end.

According to the Aeronautical Information Manual (AIM), Section 4-3-10 Intersection Takeoffs:

"d. Controllers are required to separate small aircraft (12,500 pounds or less, maximum certificated takeoff weight) departing (same or opposite direction) from an intersection behind a large non-heavy aircraft on the same runway by ensuring that least a 3-minute interval exists between the time the preceding large aircraft has taken off and the succeeding small aircraft begins takeoff roll. To inform the pilot of the required 3-minute hold, the controller will state, 'Hold for wake turbulence.' If after considering wake turbulence hazards, the pilot feels that a lesser time interval is appropriate, the pilot may request a waiver to the 3-minute interval. To initiate such a request, simply say, 'Request waiver to 3-minute interval,' or a similar statement. Controllers may the issue a takeoff clearance if other traffic permits, since the pilot has accepted the responsibility for wake turbulence separation."

Pilot Information

Certificate:	Airline Transport	Age:	29, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 1 Valid Medical--w/ waivers/lim.	Last FAA Medical Exam:	11/27/2000
Occupational Pilot:		Last Flight Review or Equivalent:	01/23/2001
Flight Time:	2539 hours (Total, all aircraft), 476 hours (Total, this make and model), 2463 hours (Pilot In Command, all aircraft), 303 hours (Last 90 days, all aircraft), 109 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	Registration:	N760EA
Model/Series:	402C	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	402C-0056
Landing Gear Type:	Retractable - Tricycle	Seats:	10
Date/Type of Last Inspection:	06/30/2001, AAIP	Certified Max Gross Wt.:	7210 lbs
Time Since Last Inspection:	26 Hours	Engines:	2 Reciprocating
Airframe Total Time:	15140 Hours at time of accident	Engine Manufacturer:	Continental
ELT:	Installed, activated, did not aid in locating accident	Engine Model/Series:	TSIO-520-VB
Registered Owner:	Hyannis Air Service, Inc.	Rated Power:	325 hp
Operator:	Hyannis Air Service, Inc.	Operating Certificate(s) Held:	Commuter Air Carrier (135)
Operator Does Business As:	Cape Air	Operator Designator Code:	HYIA

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	BOS, 20 ft msl	Distance from Accident Site:	
Observation Time:	1225 EDT	Direction from Accident Site:	
Lowest Cloud Condition:	Few / 1900 ft agl	Visibility	10 Miles
Lowest Ceiling:	Broken / 7000 ft agl	Visibility (RVR):	
Wind Speed/Gusts:	14 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	220°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29.89 inches Hg	Temperature/Dew Point:	22° C / 17° C
Precipitation and Obscuration:			
Departure Point:	Boston, MA (BOS)	Type of Flight Plan Filed:	IFR
Destination:	Nantucket, MA (ACK)	Type of Clearance:	None
Departure Time:	1215 EDT	Type of Airspace:	Class B

Airport Information

Airport:	Logan International Airport (BOS)	Runway Surface Type:	Asphalt
Airport Elevation:	20 ft	Runway Surface Condition:	Dry
Runway Used:	22R	IFR Approach:	None
Runway Length/Width:	7860 ft / 150 ft	VFR Approach/Landing:	None

Wreckage and Impact Information

Crew Injuries:	1 Minor	Aircraft Damage:	Destroyed
Passenger Injuries:	N/A	Aircraft Fire:	On-Ground
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 Minor	Latitude, Longitude:	41.360000, -70.013333

Administrative Information

Investigator In Charge (IIC):	Robert L Hancock	Report Date:	11/28/2001
Additional Participating Persons:	John Donahue; Federal Aviation Administration; East Boston, MA		
Publish Date:			
Investigation Docket:	NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at pubinq@ntsb.gov , or at 800-877-6799. Dockets released after this date are available at http://dms.nts.gov/pubdms/ .		

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