Aviation Investigation Final Report

Location:	Reading, Pennsylvania	**Accident Number:**	NYC04LA044
Date & Time:	December 6, 2003, 04:39 Local	**Registration:**	N700QD
Aircraft:	Socata TBM 700	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	1 None
Flight Conducted Under:	Part 91: General aviation - Executive/Corporate		

Analysis

The airplane departed while it was snowing. The pilot reported that becoming airborne, the airplane, "...began to shake severely...." The pilot tried to climb; however, the airplane would not climb and it continued to settle. The pilot performed a forced landing in an field, about 3,200 feet from the departure end of the runway. The company director of operations (D/O) reported that when he examined the airplane about 45 minutes later, there was rough granular ice on the top surface of the wing that conformed to the outline of the fuel tanks. The rough granular ice was not found on the horizontal stabilizer. The pilot reported that he elected not to use liquid deicing fluid on the wings because the snow was blowing off of the top of the wings when the airplane was pulled from the hangar. The D/O further reported that the airplane had been refueled with 177 gallons about 2 hours prior to departure and then the airplane was placed in an unheated hangar with the door open. The fuel came from a truck that had been kept in a heated hangar.

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 not apply de-icing fluid to the wings prior to takeoff, which resulted in snow/ice contamination on the of the wings, a stall mush, and a forced landing in an open field.

Findings

Occurrence #1: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: TAKEOFF - INITIAL CLIMB

Findings
1. (F) WEATHER CONDITION - SNOW
2. (C) ICE/FROST REMOVAL FROM AIRCRAFT - NOT PERFORMED - PILOT IN COMMAND
3. (C) AIRFRAME - ICE
4. AIRCRAFT PERFORMANCE,CLIMB CAPABILITY - DETERIORATED
5. AIRSPEED - INADEQUATE - PILOT IN COMMAND
6. STALL

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

Findings
7. TERRAIN CONDITION - OPEN FIELD

Factual Information

On December 6, 2003, at 0439 eastern standard time, a Socata TBM 700, N700QD, operated by Quest Diagnostics, Inc., was substantially damaged while departing Reading Regional Airport (RDG), Reading, Pennsylvania. The certificated airline transport pilot was not injured. Instrument meteorological conditions prevailed for the flight, that was destined for Norwood Memorial Airport (OWD), Norwood, Massachusetts. An instrument flight rules flight plan had been filed for the corporate flight that was conducted under 14 CFR Part 91.

The pilot reported that he came on duty at 0350, for a series of flights. The purpose of the flights was to pick up and transport medical specimens to various regional laboratories for analysis. The airplane was in an unheated hanger, with the doors open. The pilot further reported:

"...At that time, I conducted a preflight inspection of the aircraft (Socata TBM-700, N700QD) assigned to that flight. At the time of the preflight inspection, I had a conversation with the Line Service Personnel who was on duty. It was brought to my attention that the aircraft had completed Flight #920 earlier and had arrived at the Quest Diagnostics' hangar at approximately 0220 hrs. At approximately 0235 hrs, the aircraft was fueled (topped off) and placed in the front of the Quest hangar. The hangar doors were kept open and the heat was off. The heat was off the entire night....."

"While the aircraft was in the hangar, I conducted the preflight inspection. Due to it snowing, I paid close attention to ice and snow. The aircraft was free of all ice and snow. At such time, there were no discrepancies noted."

"At approximately 0431 hrs., Line Service pulled the aircraft out of the hangar by tug and I immediately boarded the aircraft and began the start procedure. At that time, all systems were checked and there were no abnormalities noted. Because it was snowing, all de-ice systems except the wing boots were utilized at this time and ATIS was received."

"At approximately 0434 hrs., I began my taxi to Runway 13 via Taxiway G and C without incident."

"At approximately 0437 hrs., I held short of Runway 13 at Taxiway C. At that time, I conducted a run-up of the aircraft and "last minute" line checks were completed. No abnormalities were noted. Due to a contaminated runway (snow), zero flaps were used as per POH."

At approximately 0439 hrs, I began the takeoff roll. Prior to rotation, all systems and engine gauges were checked. All good, a seemingly normal takeoff roll with snow on the runway. At approximately 90 kts, I began rotation (somewhere prior to Taxiway D intersection).

Approximately 4 - 5 seconds after lift off, the aircraft began to shake severely. At that time, engine instruments were checked and all were normal, and airspeed was checked at 110 kts. It was clear to me that the aircraft was not climbing. I held 110 kts. as long as I thought I could. At that point, I felt that putting the aircraft back on-the-ground was not an option. I believed a straight out climb was the only option. I then increased the pitch angle to approximately 80 kts. At that point, the stall horn was heard. I then pushed the yoke forward. For the remainder of the flight, I basically kept the wings level and the airspeed just above stall. The aircraft came to rest approximately one (1) mile southeast of the airport in a construction site.

In a follow-up interview, the pilot reported that he elected not to de-ice the wings because the snow was blowing off the top of the wing.

The company director of operations reported that the fuel used to refuel the airplane came from a truck that had been kept in a heated hanger. Further, when he examined the airplane about 45 minutes after the accident, he observed that the fuselage was wrinkled, the landing gear had collapsed, and the right wing was separated from the fuselage. The outboard portion of one propeller blade was missing, and not recovered. In addition, rough granular ice was observed on the tops of both wings. The shape of the ice defined the shape of the fuel tank in each wing. No ice was observed outboard of the fuel tanks, or on the top of the horizontal stabilizer.

The accident site was located about 3,200 feet from the departure end of the runway 13, on a magnetic heading of 118 degrees.

The propeller blade with the missing tip was sectioned below the fracture and forwarded to the Safety Board Materials Laboratory for examination. The examination revealed features typical overstress bending.

The 0426 weather observation at Reading included winds from 020 degrees at 11 knots, visibility 1/2 statute mile, snow, freezing fog, and a ceiling of 300 feet broken. The temperature and dew point were -3 degrees Celsius and -4 degrees Celsius, respectively.

Pilot Information

Certificate:	Airline transport; Commercial	**Age:**	34,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 1 Valid Medical--no waivers/lim.	**Last FAA Medical Exam:**	October 28, 2003
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	September 17, 2003
Flight Time:	6500 hours (Total, all aircraft), 2000 hours (Total, this make and model), 210 hours (Last 90 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Socata	**Registration:**	N700QD
Model/Series:	TBM 700	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	174
Landing Gear Type:	Retractable - Tricycle	**Seats:**	2
Date/Type of Last Inspection:	November 21, 2003 AAIP	**Certified Max Gross Wt.:**	6614 lbs
Time Since Last Inspection:	68.5 Hrs	**Engines:**	1 Turbo prop
Airframe Total Time:	2568 Hrs at time of accident	**Engine Manufacturer:**	Pratt & Whitney Canada
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	PT6A-64
Registered Owner:	Quest Diagnostics Inc.	**Rated Power:**	700 Horsepower
Operator:		**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument (IMC)	**Condition of Light:**	Night/dark
Observation Facility, Elevation:	RDG,344 ft msl	**Distance from Accident Site:**	1 Nautical Miles
Observation Time:	04:26 Local	**Direction from Accident Site:**	300°
Lowest Cloud Condition:		**Visibility**	0.5 miles
Lowest Ceiling:	Broken / 300 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	11 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	20°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.95 inches Hg	**Temperature/Dew Point:**	-3°C / -4°C
Precipitation and Obscuration:	N/A - None - Fog		
Departure Point:	Reading, PA (RDG)	**Type of Flight Plan Filed:**	IFR
Destination:	Norwood, MA (OWD)	**Type of Clearance:**	IFR
Departure Time:	04:39 Local	**Type of Airspace:**	Class G

Airport Information

Airport:	Reading Regional Airport RDG	**Runway Surface Type:**	Asphalt
Airport Elevation:	344 ft msl	**Runway Surface Condition:**	Snow
Runway Used:	13	**IFR Approach:**	None
Runway Length/Width:	6350 ft / 150 ft	**VFR Approach/Landing:**	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 None	**Latitude, Longitude:**	40.374443,-75.946945

Administrative Information

Investigator In Charge (IIC):	Hancock, Robert
Additional Participating Persons:	James Eyer; Federal Aviation Admininstration; Allentown, PA
Original Publish Date:	June 30, 2004
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=58435