



Aviation Investigation Final Report

Location:	McMurdo Station,	Accident Number:	ANC08TA028
Date & Time:	December 20, 2007, Local	Registration:	C-FMKB
Aircraft:	Douglas DC-3T	Aircraft Damage:	Substantial
Defining Event:		Injuries:	1 Minor, 9 None
Flight Conducted Under:	Public aircraft		

Analysis

The flightcrew was departing from an area of snow-covered terrain in the turbine-powered, wheel/ski-equipped airplane. The captain said that during the takeoff run, as the airplane neared 70 knots, he moved the airplane's control column aft in an attempt to lower the tail, and attain a flying attitude. Just before the airplane became airborne, the right wing lifted and left wing struck the snow-covered terrain, which pivoted the airplane 90 degrees to the left. Both main landing gear assemblies collapsed and the airplane came to rest on the belly, sustaining substantial damage to the left wing and fuselage. The first officer reported that during the takeoff run, as the airplane neared 60 knots, and as the captain moved the control column aft, she felt the airplane's tailwheel contact the hard packed snow. The first officer said that other captains that she had flown with usually attain a higher airspeed before becoming airborne. The cockpit voice recorder revealed that the highest airspeed that the first officer called out during the takeoff run was 60 knots, about 3 to 5 seconds prior to the crash.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The captain's decision to lift off before attaining a proper airspeed, resulting in a loss of control during takeoff.

Findings

Occurrence #1: LOSS OF CONTROL - ON GROUND/WATER
Phase of Operation: TAKEOFF

Findings

1. (C) AIRSPEED - LOW - PILOT IN COMMAND
2. (C) LIFT-OFF - PREMATURE - PILOT IN COMMAND

Occurrence #2: ON GROUND/WATER ENCOUNTER WITH TERRAIN/WATER

Phase of Operation: TAKEOFF - ROLL/RUN

Findings

3. TERRAIN CONDITION - SNOW COVERED

Occurrence #3: GEAR COLLAPSED

Phase of Operation: TAKEOFF - ROLL/RUN

Factual Information

On December 20, 2007, about 0123 New Zealand daylight time, a turbine powered, wheel/ski-equipped Douglas DC-3T, C-FMKB, sustained substantial damage during an on-ground collision with snow-covered terrain during takeoff from a remote site, about 547 miles east of McMurdo Station, Antarctica. The airplane was being operated by the National Science Foundation's Antarctica Mission as a public use flight. The airplane and crew were provided under contract to the National Science Foundation by Kenn Borek Air, Ltd., Calgary, Alberta, Canada. Of the 10 people on board, the airline transport pilot and eight passengers sustained no injuries, and the first officer sustained minor injuries. Visual meteorological conditions prevailed, and company flight following procedures were in effect.

The National Science Foundation public use aircraft contract with Kenn Borek Air, Ltd., is administered by the United States Department of the Interior (DOI), Aviation Management Directorate (AMD).

During a telephone conversation with the National Transportation Safety Board (NTSB) investigator-in-charge (IIC) on December 23, about 1310 Alaska standard time, the accident captain reported that the purpose of the flight was to provide aviation support services to the scientific research team. He noted that the outbound flight to a prearranged site near Mt. Paterson was uneventful. After arriving at the site, the research team installed a monitoring station, which required about 5 to 6 hours to complete. The captain said both he and the first officer remained at the airplane and waited for the research team to complete the installation. Once the research team completed their work, they returned to the airplane, and the airplane was prepared for departure.

The captain reported that his takeoff site consisted of hard packed, wind blown snow, which was atop a 5-degree down slope. He said that during the takeoff run, as the airplane neared 70 knots, he moved the airplane's control column aft in an attempt to lower the tail, and attain a flying attitude. He said that just before the airplane became airborne, the right wing lifted and left wing struck the snow-covered terrain, which pivoted the airplane 90 degrees to the left. He said that both main landing gear assemblies collapsed, and the airplane came to rest on its belly.

During a telephone conversation with the NTSB IIC on December 26, about 0945 Alaska standard time, the first officer reported that during the takeoff run, as the airplane neared 60 knots, and as the captain moved the control column aft, she felt the airplane's tailwheel contact the hard packed snow. She said she told the captain the airplane was not going to fly just before the left wing struck the snow-covered terrain. She added that as the airplane pivoted to the left, her seatbelt buckle opened, and she subsequently struck her head on the cockpit overhead console before the airplane stopped.

The first officer noted that other DC-3T captains that she had flown with used a higher takeoff airspeed, closer to 70 knots instead of 60 knots. She added that a typical takeoff rotation airspeed speed is about 73 to 75 knots for an airplane operating at a similar gross weight. The airplane sustained substantial damage to the left wing and fuselage.

The captain and first officer both reported that there were no preaccident mechanical anomalies with the airplane.

The Cockpit Voice Recorder (CVR) was removed from the airplane and sent to the NTSB vehicle recorder laboratory in Washington, DC. A Safety Board aerospace engineer reviewed the recorded data. No CVR listening group was convened, but a summary of key events of the accident flight was prepared.

According to the data contained on the CVR, about 26 seconds before impact, the captain instructed the first officer to: "Set power," and the first officer responded by saying: "Powers set." About 6 seconds later the first officer said: "Airspeed's alive." About 12 seconds after that, the first officer said: "It's not gunna come off," followed about 3 seconds later with: "There's sixty [knots]." About 3 seconds afterward the first officer says: "Ah ____" (expletive), which was followed by the sound of impact.

A copy of the CVR summary is included in the public docket for this accident.

Pilot Information

Certificate:	Airline transport	Age:	51, Male
Airplane Rating(s):	Single-engine land; Single-engine sea; Multi-engine land	Seat Occupied:	Left
Other Aircraft Rating(s):		Restraint Used:	
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 1 Without waivers/limitations	Last FAA Medical Exam:	August 29, 2007
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	September 26, 2007
Flight Time:	17446 hours (Total, all aircraft), 357 hours (Total, this make and model), 12500 hours (Pilot In Command, all aircraft), 60 hours (Last 90 days, all aircraft), 60 hours (Last 30 days, all aircraft), 8 hours (Last 24 hours, all aircraft)		

Co-pilot Information

Certificate:	Age:
Airplane Rating(s):	Seat Occupied:
Other Aircraft Rating(s):	Restraint Used:
Instrument Rating(s):	Second Pilot Present: Yes
Instructor Rating(s):	Toxicology Performed: No
Medical Certification:	Last FAA Medical Exam:
Occupational Pilot:	Last Flight Review or Equivalent:
Flight Time:	

Co-pilot Information

Certificate:	Commercial	Age:	26,Female
Airplane Rating(s):	Single-engine land; Multi-engine land	Seat Occupied:	Right
Other Aircraft Rating(s):		Restraint Used:	
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 1 Without waivers/limitations	Last FAA Medical Exam:	July 25, 2007
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	November 1, 2007
Flight Time:	1377 hours (Total, all aircraft), 597 hours (Total, this make and model), 180 hours (Pilot In Command, all aircraft), 136 hours (Last 90 days, all aircraft), 32 hours (Last 30 days, all aircraft), 8 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Douglas	Registration:	C-FMKB
Model/Series:	DC-3T	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	
Airworthiness Certificate:	Normal	Serial Number:	19560
Landing Gear Type:	Tailwheel; Ski/wheel	Seats:	10
Date/Type of Last Inspection:	April 30, 2007 100 hour	Certified Max Gross Wt.:	25591 lbs
Time Since Last Inspection:	67.2 Hrs	Engines:	2
Airframe Total Time:	32516.2 Hrs as of last inspection	Engine Manufacturer:	
ELT:	Installed, not activated	Engine Model/Series:	
Registered Owner:	Kenn Borek Air LTD.	Rated Power:	
Operator:	Kenn Borek Air LTD.	Operating Certificate(s) Held:	Foreign air carrier (129)

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
Observation Facility, Elevation:		Distance from Accident Site:	
Observation Time:		Direction from Accident Site:	
Lowest Cloud Condition:	Clear	Visibility	10 miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	/	Turbulence Type Forecast/Actual:	/
Wind Direction:		Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	28.42 inches Hg	Temperature/Dew Point:	
Precipitation and Obscuration:			
Departure Point:	McMurdo Station	Type of Flight Plan Filed:	Company VFR
Destination:	Mt. Paterson RA (MB4)	Type of Clearance:	None
Departure Time:	01:23 Local	Type of Airspace:	

Wreckage and Impact Information

Crew Injuries:	1 Minor, 3 None	Aircraft Damage:	Substantial
Passenger Injuries:	6 None	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 Minor, 9 None	Latitude, Longitude:	-78.016944,-154.966949(est)

Administrative Information

Investigator In Charge (IIC):	Johnson, Clinton
Additional Participating Persons:	Jon Lee; Transport Safety Board (TSB); Edmonton, Alberta John E Mills; US Department of the Interior; Bosie , ID
Original Publish Date:	March 5, 2009
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=67394

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, “accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person” (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available [here](#).