National Transportation Safety Board
Aviation Accident Final Report

Location:	FORT WORTH, TX	**Accident Number:**	FTW01LA049
Date & Time:	01/11/2001, 1614 CST	**Registration:**	N824ED
Aircraft:	de Havilland DHC-6-300	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	3 None
Flight Conducted Under:	Part 91: General Aviation - Business		

Analysis

The flight was cleared for an ILS approach and as the airplane was approaching the point of glideslope intercept, both engines lost power. The airplane was vectored toward a nearby airport; however, after exiting the clouds, the pilot realized that the flight could not make the airport. The pilot initiated a forced landing to a field, and during the landing roll, the airplane crossed a road, and the right wing struck a tree. Subsequently, the nose landing gear separated when it struck a dirt berm. The airplane came to a stop upright. Examination of the fuel system revealed the aft main tank was 1/3-1/2 full of fuel, and the forward main tank 90% full of fuel. Examination of the cockpit revealed that the fuel selector for the main tanks was found in the NORMAL position. With the selector in the NORMAL position, the aft main tank supplies fuel to the left engine, and the forward main tank supplies fuel to the right engine. Examination of the fuel system revealed no discrepancies. The fuel boost pumps were activated and fuel flowed from the fuel supply lines. The left and right airframe fuel filters and the left and right engine fuel filters contained fuel. Examination of both engines revealed no anomalies that would have precluded the operation of the engines. The pilot reported that at the time of the dual engine failure, the fuel selector was selecting the aft tank, thereby feeding both engines from the aft fuel tank. He further reported that when both engines failed, he immediately switched the fuel selector to "NORMAL". The aircraft's flight manual directs the pilot to position the fuel selector to "NORMAL" prior to takeoff and for landing.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: the loss of power to both engines for undetermined reasons during approach. Contributing factors were the pilot's failure to properly position the fuel selector in accordance with the landing checklist and the lack of suitable terrain for the forced landing.

Findings

Occurrence #1: LOSS OF ENGINE POWER
Phase of Operation: APPROACH - FAF/OUTER MARKER TO THRESHOLD (IFR)

Findings
1. ALL ENGINES
2. (C) REASON FOR OCCURRENCE UNDETERMINED
3. (F) FUEL TANK SELECTOR POSITION - IMPROPER - PILOT IN COMMAND
4. (F) CHECKLIST - NOT FOLLOWED - PILOT IN COMMAND

Occurrence #2: FORCED LANDING
Phase of Operation: EMERGENCY DESCENT/LANDING

Occurrence #3: ON GROUND/WATER COLLISION WITH OBJECT
Phase of Operation: LANDING - ROLL

Findings
5. (F) TERRAIN CONDITION - NONE SUITABLE
6. TERRAIN CONDITION - BERM
7. OBJECT - TREE(S)

Factual Information

On January 11, 2001, approximately 1614 central standard time, a Dehavilland DHC-6-300, twin-engine airplane, N824ED, was substantially damaged when it impacted trees and terrain during a forced landing following a dual engine failure during an ILS 34R approach to Meacham Airport, near Fort Worth, Texas. The airplane was owned by Twin Otter, LLC, of Gaithersburg, Maryland, and operated by Earth Data Aviation of Haggerstown, Maryland. Instrument meteorological conditions prevailed, and an instrument flight rules (IFR) flight plan was filed for the 14 Code of Federal Regulations Part 91 business flight. The commercial pilot and his two passengers were not injured. The cross-country flight originated from Alexandria, Louisiana, at 1315.

The pilot reported to the NTSB investigator-in-charge (IIC) that on the day prior to the accident, the airplane was fueled at Essler Regional Airport, near Alexandria, Louisiana, and flown to the Alexandria International Airport where it was placed in a hangar for the night. On the day of the accident, the flight departed Alexandria for Fort Worth, Texas. The passengers were planning to deplane at Fort Worth, and the pilot planned to continue the flight to Houston, Texas. The pilot stated that before starting a descent from 6000 feet msl, he performed the before landing checklist and switched to the NORMAL position on the fuel selector. The flight was cleared for the ILS 34R approach and as the airplane was approaching the point of glideslope intercept, both engines lost power. The airplane was vectored toward the Sycamore Airport; however, after exiting the clouds, the pilot realized that the flight could not make the airport. The pilot initiated a forced landing to a field, and during the landing roll, the airplane crossed a road, and the right wing struck a tree. Subsequently, the nose landing gear separated when it struck a dirt berm. The airplane came to a stop upright.

The pilot later reported that after reviewing the events that transpired, he determined that at the time of the dual engine failure, the fuel selector was selecting the aft tank, thereby feeding both engines from the aft fuel tank. He further reported that when both engines failed, he immediately switched the fuel selector to "Both" ("NORMAL").

The FAA inspector responding to the site found the aft main tank 1/3-1/2 full of fuel, and the forward main tank 90% full of fuel. The integrity of the right wing tank was compromised and fuel was leaking from the right wing. The left wing tank was found empty. Examination of the cockpit revealed that the fuel selector for the main tanks was found in the NORMAL position. The inspector reported that in the NORMAL position, the aft main tank supplies fuel to the left engine, and the forward main tank supplies fuel to the right engine.

According to the aircraft manufacturer, with the fuel selector in the NORMAL position, each engine is fed by an independent fuel supply, and in the absence of multiple failures, a double flameout would not occur, particularly with no prior indication, unless the fuel was contaminated. The manufacturer representative stated that "it is conceivable that there was a problem with the aft tank related to the ability of the ejector system to keep the collector tank full. A flapper valve stuck in the open position or an ejector system fault are the most likely candidates. These would result in a uniform fuel level in all the cells in the aft tank. Although the collector would not stay topped up, the low level fuel warning would illuminate with approximately 330 lbs of fuel instead of 75 lbs. In addition to the low fuel warning, the caution lights for both boost pumps would illuminate, indicating a loss of fuel pressure."

Examination of the fuel system, by the NTSB IIC and the FAA inspector revealed that the flapper valve was not stuck open, no faults were found with the ejector system, and the low level fuel warning light illuminated when tested. The fuel boost pumps were activated and fuel flowed from the fuel supply lines. The left and right airframe fuel filters and the left and right engine fuel filters contained fuel. No anomalies were observed during the examination of the fuel system.

A representative from Pratt & Whitney, under the supervision of the NTSB IIC, examined both engines. No anomalies were observed that would have precluded the operation of the engines.

The aircraft's flight manual directs the pilot to position the fuel selector to "NORMAL" prior to takeoff and for approach.

Pilot Information

Certificate:	Commercial	**Age:**	40, 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):	Airplane Multi-engine; Airplane Single-engine	**Toxicology Performed:**	No
Medical Certification:	Class 1 Valid Medical--no waivers/lim.	**Last Medical Exam:**	06/26/2001
Occupational Pilot:		**Last Flight Review or Equivalent:**	11/20/1999
Flight Time:	3344 hours (Total, all aircraft), 214 hours (Total, this make and model), 3195 hours (Pilot In Command, all aircraft), 214 hours (Last 90 days, all aircraft), 103 hours (Last 30 days, all aircraft), 3 hours (Last 24 hours, all aircraft)		

Other Flight Crew Information

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

Other Flight Crew Information

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

Aircraft and Owner/Operator Information

Aircraft Manufacturer:	de Havilland	**Registration:**	N824ED
Model/Series:	DHC-6-300	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	No
Airworthiness Certificate:	Normal	**Serial Number:**	824
Landing Gear Type:	Retractable - Tricycle	**Seats:**	6
Date/Type of Last Inspection:	11/21/2000, Continuous Airworthiness	**Certified Max Gross Wt.:**	12500 lbs
Time Since Last Inspection:	122.3 Hours	**Engines:**	2 Turbo Prop
Airframe Total Time:	6011.5 Hours	**Engine Manufacturer:**	P&W
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	PT6A-27
Registered Owner:	Twin Otter LLC	**Rated Power:**	680 hp
Operator:	Earth Data Aviation	**Air Carrier Operating Certificate:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	**Condition of Light:**	Day
Observation Facility, Elevation:	FTW, 710 ft msl	**Observation Time:**	1553 CST
Distance from Accident Site:	22 Nautical Miles	**Direction from Accident Site:**	35°
Lowest Cloud Condition:		**Temperature/Dew Point:**	7°C / 4°C
Lowest Ceiling:	Overcast / 1100 ft agl	**Visibility**	10 Miles
Wind Speed/Gusts, Direction:	7 knots, 320°	**Visibility (RVR):**	
Altimeter Setting:	30.15 inches Hg	**Visibility (RVV):**	
Precipitation and Obscuration:			
Departure Point:	ALEXANDRIA, LA (AEX)	**Type of Flight Plan Filed:**	IFR
Destination:	FORT WORTH, TX (FTW)	**Type of Clearance:**	IFR
Departure Time:	1315 CST	**Type of Airspace:**	Class D

Airport Information

Airport:	FORT WORTH MEACHAM (FTW)	**Runway Surface Type:**	
Airport Elevation:	710 ft	**Runway Surface Condition:**	
Runway Used:	34R	**IFR Approach:**	ILS
Runway Length/Width:		**VFR Approach/Landing:**	Forced Landing

Wreckage and Impact Information

Crew Injuries:	3 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	N/A	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	3 None	**Latitude, Longitude:**	

Administrative Information

Investigator In Charge (IIC):	DOUGLAS D WIGINGTON	**Adopted Date:**	09/27/2001
Additional Participating Persons:	Arnold L Thormeyer; FAA FSDO; Fort Worth, TX		
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.ntsb.gov/pubdms/.		

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