National Transportation Safety Board
Aviation Accident Final Report

Location:	PORT ALSWORTH, AK	**Accident Number:**	ANC01LA129
Date & Time:	08/29/2001, 1900 AKD	**Registration:**	N2225C
Aircraft:	de Havilland C-7A	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	2 Minor
Flight Conducted Under:	Part 91: General Aviation - Positioning		

Analysis

The captain and the first officer were landing a short takeoff and landing (STOL) cargo airplane on a private, dirt and gravel surface runway. The airplane was configured for landing with 40 degrees of flaps. During the landing approach, variations in indicated airspeed and ground speed indicated windshear conditions. About 100 to 200 feet above the ground, the airplane encountered a downdraft and began to drift to the right of the runway centerline. The captain said she increased engine power and applied full left aileron and rudder, but could not gain directional or pitch control of the airplane. The right wing struck trees, short of the runway threshold, increasing the airplane's right yaw. The captain said that as the airplane neared the ground, she pulled the engine throttles off. The airplane struck the ground with the right main landing gear and right front portion of the fuselage. The airplane then pivoted to the right, 180 degrees from the approach heading. The owner of the airport reported that wind conditions from the east may produce downdrafts in the area of runway 05. He indicated that at the time of the accident, the wind was blowing from the east about 15 knots. The first officer reported the captain appeared to be attempting to maintain a stabilized approach angle by varying the pitch attitude of the airplane. A review of company training literature revealed that the airplane is especially sensitive to slight wind shear, and wind gusts as low as 5 knots when operating at low airspeeds. Pilots are cautioned that when flying the aircraft at low speeds, a large application of the aileron control may be required to maintain wings level. During gusty wind conditions, the threshold airspeed should be increased by one-half the gust factor, and any lateral displacement should be corrected rapidly. If a wing is allowed to drop beyond corrective action of full aileron, power should be increased immediately to regain level flight.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The captain's failure to maintain the proper glidepath, and improper short field landing procedures. Factors in the accident were a downdraft, and the captain's inadequate evaluation of the weather conditions.

Findings

Occurrence #1: IN FLIGHT ENCOUNTER WITH WEATHER
Phase of Operation: APPROACH - VFR PATTERN - FINAL APPROACH

Findings
1. (F) WEATHER CONDITION - DOWNDRAFT
2. (F) WEATHER EVALUATION - INADEQUATE - PILOT IN COMMAND

Occurrence #2: UNDERSHOOT
Phase of Operation: APPROACH - VFR PATTERN - FINAL APPROACH

Findings
3. (C) PROPER GLIDEPATH - NOT MAINTAINED - PILOT IN COMMAND
4. (C) SHORT FIELD LANDING/PROCEDURE - IMPROPER - PILOT IN COMMAND

Factual Information

On August 29, 2001, about 1900 Alaska daylight time, a deHavilland C-7A airplane, N2225C, sustained substantial damage during a landing approach at Port Alsworth, Alaska. The airplane was being operated as a visual flight rules (VFR) positioning flight under Title 14, CFR Part 91, when the accident occurred. The airplane was operated by Greatland Air Cargo Inc., Anchorage, Alaska. The captain and the first officer received minor injuries. Visual meteorological conditions prevailed, and VFR company flight-following procedures were in effect. The flight originated at the Iliamna Airport, Iliamna, Alaska, at 1840.

During a telephone conversation with the National Transportation Safety Board (NTSB) investigator-in-charge (IIC), on August 29, the company president reported the airplane was being positioned to Port Alsworth to pick up cargo. The airplane is a short takeoff and landing (STOL) cargo airplane. The president said the captain told him that the airplane encountered a downdraft during the final approach phase for landing on runway 05L at Port Alsworth. The airplane collided with several trees short of the runway threshold, and came to rest along the right edge of the gravel runway.

In an interview with the captain on August 30, the captain told the NTSB IIC that light to moderate turbulence was encountered during the flight to Port Alsworth. During the landing approach, variations in indicated airspeed and ground speed indicated windshear conditions. As a consequence, the captain said she increased engine power. About 100 to 200 feet above the ground, the airplane suddenly encountered a downdraft and began to drift to the right of the runway centerline. The airplane was configured for landing with 40 degrees of flaps. The captain said she again increased engine power to over 30 inches of manifold pressure, and applied full left aileron and rudder, but could not gain directional or pitch control of the airplane. The right wing struck trees, short of the runway threshold, increasing the airplane's right yaw. The captain said that as the airplane neared the ground, she pulled the engine throttles off. The airplane struck the ground with the right main landing gear and right front portion of the fuselage. The airplane then pivoted to the right, 180 degrees from the approach heading.

The captain reported the accident flight was her first landing on runway 5L at Port Alsworth, although she had landed on a parallel runway numerous times. The accident flight was the first duty day together as a crew, and the first flight with the first officer to the accident airport.

In a telephone conversation with the first officer on September 4, 2001, he reported the approach to the runway was conducted with full flaps. He said the engine power was between 17 and 22 inches of manifold pressure, and the captain appeared to be attempting to maintain a stabilized descent angle by varying the pitch attitude of the airplane. The ground speed was indicating 53 knots, and the airspeed was 80 knots. The vertical descent speed was about 600 feet per minute. As the airplane neared the ground, the first officer said the airspeed began to fluctuate between 5 to 10 knots, but the airplane did not stall. He said he told the captain about the airplane's close proximity to trees along the displaced threshold area. The airplane appeared to encounter a downdraft, and the right wing collided with the trees. The airplane rolled to the right, and descended in a right wing low attitude.

The company's training program literature contains information about the airplane's flight characteristics, and includes a discussion about the flight controls. A warning section states, in part: "When operating close to stall speeds with gear extended and flaps full down, such as

short field landings, slipping the aircraft through excessive use of rudder must be avoided. Under these conditions, with the aircraft in a bank, application of top rudder can cause the angle of bank to increase rapidly and uncontrollably unless immediate corrective action is taken to neutralize the rudder and/or increase airspeed." The airplane's level flight characteristics section states, in part: "When flying the aircraft at low speeds a large application of the aileron control will be required to maintain wings level. In addition, any lateral displacement should be corrected rapidly, particularly in gusty conditions. If a wing is allowed to drop beyond corrective action of full aileron, power should be increased immediately to regain level flight."

The company's training program also contains information about short field landings, which states, in part: "A power off approach is not recommended. The short field landing performance data is based on an idle power approach to obtain the minimum air distance possible. Ground run distance will not be affected by a powered or unpowered approach if proper threshold airspeed is indicated at the initiation of flare. The aircraft is especially sensitive to slight wind shear, and wind gusts as low as 5 knots. Dropping the nose to pick up airspeed loss due to wind shear is not recommended without a corresponding increase in power, since rate of descent will increase significantly. ...In the flare, a 2 knot gust increase has a noticeable effect on how well the flare decreases rate of descent; while a 2 knot decrease is about the maximum acceptable without increasing power. Be prepared to arrest rate of descent with power if the flare is not effective. CAUTION: Short field landing distances can only be repeated if threshold speeds as precisely maintained. During gusty wind conditions, increase threshold airspeed by one-half the gust factor."

The captain reported that following the accident, the number two, outboard flap segment of the right wing, was found separated from the airplane. The captain said she thought it was possible that the outboard hinge of the flap segment failed, allowing the flap to pivot and trail inboard, departing the airplane before any collision with trees.

Examination of photographs provided by the captain revealed the flap segment had aft bending and downward buckling about midspan of the leading edge of the flap. The left, inboard attach point was bent inboard and torn from the flap extension mechanism. The aft stringer of the right, outboard attach point, was fractured at the bottom edge of the flap and was bent outboard. The forward stringer of the outboard attach point was torn entirely out of the flap assembly along its rivet line. A portion of the right, vertical side of the flap adjacent to the forward stringer, was torn off the flap and remained attached to the attaching mechanism.

Port Alsworth is a private airport located along the shore of Lake Clark, Alaska. Runway 05L is 3,000 feet long, by 100 feet wide. During a telephone conversation with the NTSB IIC on August 30, the owner of the airport reported that wind conditions from the east may produce downdrafts in the area of runway 05. He indicated that at the time of the accident, the wind was blowing from the east about 15 knots.

At 1650, an Aviation Routine Weather Report (METAR) from Port Alsworth was reporting in part: Wind, 050 degrees (true) at 12 knots; visibility, 30 statute miles; clouds and sky condition, 8,000 feet broken, 10,000 feet overcast; temperature, 57 degrees F; dew point, 45 degrees F; altimeter, 29.43 inHg.

At 2055, a METAR from Port Alsworth was reporting in part: Wind, 080 degrees (true) at 12 knots; visibility, 30 statute miles; clouds and sky condition, 8,000 feet broken, 10,000 feet

broken; temperature, 54 degrees F; dew point, 43 degrees F; altimeter, 29.41 inHg.

Although requested, a Pilot/Operator Aircraft Accident Report, (NTSB form 6120.1/2) was not submitted by the captain or the president of the company.

Pilot Information

Certificate:	Airline Transport; Commercial; Flight Engineer	**Age:**	39, Female
Airplane Rating(s):	Multi-engine Land; Single-engine Land; Single-engine Sea	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 1 Valid Medical--no waivers/lim.	**Last Medical Exam:**	07/21/2001
Occupational Pilot:		**Last Flight Review or Equivalent:**	04/16/2001
Flight Time:	6200 hours (Total, all aircraft), 559 hours (Total, this make and model)		

Co-Pilot Information

Certificate:	Airline Transport; Commercial	**Age:**	38, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	None	**Restraint Used:**	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 1 Valid Medical--no waivers/lim.	**Last Medical Exam:**	04/27/2001
Occupational Pilot:		**Last Flight Review or Equivalent:**	
Flight Time:	10000 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Manufacturer:	de Havilland	**Registration:**	N2225C
Model/Series:	C-7A	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	No
Airworthiness Certificate:		**Serial Number:**	63-9754
Landing Gear Type:	Retractable - Tricycle	**Seats:**	2
Date/Type of Last Inspection:		**Certified Max Gross Wt.:**	28500 lbs
Time Since Last Inspection:		**Engines:**	2 Reciprocating
Airframe Total Time:		**Engine Manufacturer:**	
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	
Registered Owner:	GREATLAND AIR CARGO INC.	**Rated Power:**	
Operator:	GREATLAND AIR CARGO INC.	**Air Carrier Operating Certificate:**	On-demand Air Taxi (135)
Operator Does Business As:		**Operator Designator Code:**	G20C

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	**Condition of Light:**	Day
Observation Facility, Elevation:	PALJ	**Observation Time:**	1650 ADT
Distance from Accident Site:		**Direction from Accident Site:**	
Lowest Cloud Condition:		**Temperature/Dew Point:**	14°C / 7°C
Lowest Ceiling:	Broken / 8000 ft agl	**Visibility**	30 Miles
Wind Speed/Gusts, Direction:	12 knots, 50°	**Visibility (RVR):**	
Altimeter Setting:	29.43 inches Hg	**Visibility (RVV):**	
Precipitation and Obscuration:			
Departure Point:	ILIAMNA, AK (PAIL)	**Type of Flight Plan Filed:**	Company VFR
Destination:	PORT ASLWORTH, AK (PALJ)	**Type of Clearance:**	None
Departure Time:	1840 ADT	**Type of Airspace:**	Class G

Airport Information

Airport:	PORT ALSWORTH (PALJ)	**Runway Surface Type:**	Dirt; Gravel
Airport Elevation:		**Runway Surface Condition:**	Dry
Runway Used:	05	**IFR Approach:**	None
Runway Length/Width:	3000 ft / 100 ft	**VFR Approach/Landing:**	Full Stop; Traffic Pattern

Wreckage and Impact Information

Crew Injuries:	2 Minor	**Aircraft Damage:**	Substantial
Passenger Injuries:	N/A	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Minor	**Latitude, Longitude:**	62.204444, -154.257778

Administrative Information

Investigator In Charge (IIC):	SCOTT ERICKSON	**Adopted Date:**	06/04/2002
Additional Participating Persons:	ROBERT MERCER; FAA-AL-ANC FSDO 03; ANCHORAGE, AK		
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/.		