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## Low-altitude microburst encounter, McDonnell Douglas DC-9-82, April 26, 1993

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**Micro-summary:** This McDonnell Douglas DC-9-82 encountered a microburst at low altitude, causing substantial damage to the airplane.

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**Event Date:** 1993-04-26 at 1722 MDT


**Investigative Body:** National Transportation Safety Board (NTSB), USA


**Investigative Body's Web Site:** <http://www.nts.gov/>

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1. Accident reports can be and sometimes are revised. Be sure to consult the investigative agency for the latest version before basing anything significant on content (e.g., thesis, research, etc).
  2. Readers are advised that each report is a glimpse of events at specific points in time. While broad themes permeate the causal events leading up to crashes, and we can learn from those, the specific regulatory and technological environments can and do change. ***Your company's flight operations manual is the final authority as to the safe operation of your aircraft!***
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		NTSB ID: DEN93FA047		Aircraft Registration Number: N14816	
		Occurrence Date: 04/26/1993		Most Critical Injury: None	
		Occurrence Type: Accident		Investigated By: NTSB	
Location/Time					
Nearest City/Place DENVER		State CO	Zip Code 80207	Local Time 1722	Time Zone MDT
Airport Proximity: On Airport		Distance From Landing Facility:		Direction From Airport:	
Aircraft Information Summary					
Aircraft Manufacturer MCDONNELL DOUGLAS		Model/Series DC-9-82		Type of Aircraft Airplane	
Sightseeing Flight: No			Air Medical Transport Flight: No		
Narrative					
Brief narrative statement of facts, conditions and circumstances pertinent to the accident/incident:					
<p>HISTORY OF FLIGHT</p> <p>On Monday, April 26, 1993, at 1722 mountain daylight time, a McDonnell Douglas DC-9-82, N14816, operating as Continental Airlines Flight 182, incurred damage to the lower aft body on landing at Stapleton International Airport, Denver, Colorado. The two pilots, four flight attendants, and 84 passengers were not injured; however, the aircraft sustained substantial damage. The aircraft was being operated under 14 CFR Part 121 when the accident occurred. Visual meteorological conditions prevailed and an IFR flight plan was filed. The flight originated in Salt Lake City, Utah, at 1616.</p> <p>PERSONNEL INFORMATION</p> <p>Details of flight crew qualifications and experience is depicted in this document and attached crew supplement. The captain on this flight was the model manager for the DC-9 fleet and was a qualified check airman in the aircraft.</p> <p>METEOROLOGICAL INFORMATION</p> <p>Recorded Stapleton International Airport weather at the time of the accident is attached and provides information that the airport weather at the time of the accident was visual meteorological conditions and that the recorded surface wind was from the northeast at 8 knots. The remarks section indicated that cumulonimbus clouds and virga were present in all quadrants and was moving to the northeast.</p> <p>The attached witness statement submitted by the captain of Continental Flight 1284, which was conducting a visual approach to runway 26L at 1720, describes what that crew experienced. A rapid gain in indicated airspeed was followed by a loss. Based on that experience, the activation of the on board wind alert system, and after witnessing the landing of the accident aircraft, they performed a go-around. The captain stated that virga was present in all quadrants and they encountered gusting conditions during the approach.</p> <p>A review of the low level wind shear alert system (LLWAS) was conducted. The recording tapes of that system did not indicate any activation of the system during the time period when the accident occurred.</p> <p>Interviews were conducted with personnel from the National Center for Atmospheric Research (NCAR), located in Boulder, Colorado. The researchers indicated that it was possible for a localized microburst to occur, which would not trigger the LLWAS system.</p> <p>AERODROME INFORMATION</p>					
FACTUAL REPORT - AVIATION					

 <p>National Transportation Safety Board <b>FACTUAL REPORT</b> AVIATION</p>	NTSB ID: DEN93FA047
	Occurrence Date: 04/26/1993
	Occurrence Type: Accident

## Narrative (Continued)

Stapleton International Airport is served by an advanced LLWAS system which was determined to be fully operational at the time of the accident.

The accident aircraft and the aircraft which conducted a go around, as discussed above, were conducting visual approaches to runways 26R and 26L respectively. These runways are parallel and are 900 feet apart centerline to centerline.

## FLIGHT RECORDERS

The flight data recorder and voice recorder were removed from the accident aircraft and sent to the National Transportation Safety Board Laboratory in Washington, D.C. The reports from the recorders are attached.

## WRECKAGE AND IMPACT INFORMATION

Flight recorder data indicated that at 47 feet above touchdown, the aircraft began to rotate and descended to 3 feet above touchdown in three seconds. Touchdown occurred with a nose up attitude of 8.334 degrees with a vertical acceleration of 2.246 Gs. At 47 feet, the indicated airspeed was 126 knots and decreased to 109 knots in 2 seconds. Touchdown occurred at 110 knots with full power being developed.

Tower personnel witnessed the touchdown and related that sparks and smoke emitted from the aircraft. This was reported to the crew.


The captain's statement is quoted as follows:


"Final approach was smooth and final landing configuration was established at approximately 1000 ft. AGL, with landing flaps at 40 degrees and a target speed of Vref plus 10 kts. on VASI. At approximately 200 ft. AGL a slight increase in airspeed was noted - to approximately Vref plus 15kts. - throttles were left at 1.25 EPR. The flight continued to an altitude of 100 ft. AGL - then experienced a rapid loss of airspeed (estimated to be greater than 25 kts.) and a large sink rate developed immediately. The throttles were advanced to mechanical stops and pitch attitude was increased to arrest sink rate, which appeared to increase until the aircraft touched down firmly on the runway. The control tower advised us that smoke and sparks were observed on touch down - First officer Gordon advised the tower of the airspeed loss. During the landing roll out we heard a number of pilots reporting large airspeed fluctuations on short final, and one or more missed approaches. The landing roll out and taxi to the gate were normal and uneventful."

Inspection of the aircraft revealed general crushing of the skin and structure on the lower aft body in the area of the tail skid. Longitudinal scarring and scragging were present on the skin surface.

## ADDITIONAL DATA/INFORMATION

The wreckage was verbally released to Continental Airlines maintenance personnel the day of the accident following inspection. The flight data recorder and cockpit voice recorder were released after they were examined.

		NTSB ID: DEN93FA047			
		Occurrence Date: 04/26/1993			
		Occurrence Type: Accident			
Landing Facility/Approach Information					
Airport Name	Airport ID:	Airport Elevation	Runway Used	Runway Length	Runway Width
STAPLETON INTERNATIONAL	DEN	5333 Ft. MSL	26R	8599	150
Runway Surface Type: Concrete					
Runway Surface Condition: Dry					
Type Instrument Approach: ILS-complete; Visual					
VFR Approach/Landing: Straight-in					
Aircraft Information					
Aircraft Manufacturer		Model/Series		Serial Number	
MCDONNELL DOUGLAS		DC-9-82		49370	
Airworthiness Certificate(s): Transport					
Landing Gear Type: Retractable - Tricycle					
Homebuilt Aircraft? No	Number of Seats: 151	Certified Max Gross Wt.	150000 LBS	Number of Engines: 2	
Engine Type:	Engine Manufacturer:	Model/Series:	Rated Power:		
Turbo Jet	P&W	JT8D-217A	20850 LBS		
- Aircraft Inspection Information					
Type of Last Inspection	Date of Last Inspection	Time Since Last Inspection	Airframe Total Time		
Continuous Airworthiness	04/1993	7 Hours	25628 Hours		
- Emergency Locator Transmitter (ELT) Information					
ELT Installed? No	ELT Operated?	ELT Aided in Locating Accident Site?			
Owner/Operator Information					
Registered Aircraft Owner		Street Address			
CITY CORP. OF NORTH AMERICA		601 MIDLAND AVE.			
		City	State	Zip Code	
		RYE	NY	10580	
Operator of Aircraft		Street Address			
CONTINENTAL AIRLINES		2929 ALLEN PKWY			
		City	State	Zip Code	
		HOUSTON	TX	77210	
Operator Does Business As:			Operator Designator Code: CALA		
- Type of U.S. Certificate(s) Held:					
Air Carrier Operating Certificate(s): Flag Carrier/Domestic					
Operating Certificate:			Operator Certificate:		
Regulation Flight Conducted Under: Part 121: Air Carrier					
Type of Flight Operation Conducted: Scheduled; Domestic; Passenger Only					
FACTUAL REPORT - AVIATION					

 <p><b>National Transportation Safety Board</b> <b>FACTUAL REPORT</b> <b>AVIATION</b></p>	NTSB ID: DEN93FA047
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**First Pilot Information**

Name On File	City On File	State On File	Date of Birth On File	Age 53
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Sex: M	Seat Occupied: Left	Principal Profession: Civilian Pilot	Certificate Number: On File
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Certificate(s): Airline Transport

Airplane Rating(s): Multi-engine Land; Single-engine Land

Rotorcraft/Glider/LTA: None

Instrument Rating(s): Airplane

Instructor Rating(s): None

Type Rating/Endorsement for Accident/Incident Aircraft? Yes	Current Biennial Flight Review?
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Medical Cert.: Class 1	Medical Cert. Status: Valid Medical--w/ waivers/lim.	Date of Last Medical Exam: 03/1993
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- Flight Time Matrix	All A/C	This Make and Model	Airplane Single Engine	Airplane Multi-Engine	Night	Instrument		Rotorcraft	Glider	Lighter Than Air
						Actual	Simulated			
Total Time										
Pilot In Command(PIC)										
Instructor										
Last 90 Days										
Last 30 Days										
Last 24 Hours										

Seatbelt Used? Yes	Shoulder Harness Used? Yes	Toxicology Performed? No	Second Pilot? Yes
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**Flight Plan/Itinerary**

Type of Flight Plan Filed: IFR

Departure Point SALT LAKE CITY	State UT	Airport Identifier SLC	Departure Time 1612	Time Zone MDT
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Destination Same as Accident/Incident Location	State	Airport Identifier	
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Type of Clearance: IFR

Type of Airspace: Class E

**Weather Information**

Source of Briefing: Commercial Weather Service

Method of Briefing:

 <p><b>National Transportation Safety Board</b> <b>FACTUAL REPORT</b> <b>AVIATION</b></p>	NTSB ID: DEN93FA047
	Occurrence Date: 04/26/1993
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<b>Weather Information</b>					
WOF ID	Observation Time	Time Zone	WOF Elevation	WOF Distance From Accident Site	Direction From Accident Site
DEN	1736	MDT	5333 Ft. MSL	0 NM	0 Deg. Mag.
Sky/Lowest Cloud Condition: Scattered			9500 Ft. AGL	Condition of Light: Day	
Lowest Ceiling: Broken		13000 Ft. AGL		Visibility: 70 SM	Altimeter: 29.00 "Hg
Temperature: 22 °C	Dew Point: -5 °C	Wind Direction: 50		Density Altitude: 2464 Ft.	
Wind Speed: 8	Gusts:	Weather Conditions at Accident Site: Visual Conditions			
Visibility (RVR): 0 Ft.	Visibility (RVV) SM	Intensity of Precipitation: Unknown			
Restrictions to Visibility: None					
Type of Precipitation: None					

<b>Accident Information</b>		
Aircraft Damage: Substantial	Aircraft Fire: None	Aircraft Explosion: None

Classification: U.S. Registered/U.S. Soil					
<b>- Injury Summary Matrix</b>	Fatal	Serious	Minor	None	TOTAL
First Pilot				1	1
Second Pilot				1	1
Student Pilot					
Flight Instructor					
Check Pilot					
Flight Engineer					
Cabin Attendants				4	4
Other Crew					
Passengers				84	84
- TOTAL ABOARD -				90	90
Other Ground	0	0	0		0
- GRAND TOTAL -	0	0	0	90	90

National Transportation Safety Board

**FACTUAL REPORT**

**AVIATION**



NTSB ID: DEN93FA047

Occurrence Date: 04/26/1993

Occurrence Type: Accident

Administrative Information

Investigator-In-Charge (IIC)

NORMAN F. WIEMEYER

Additional Persons Participating in This Accident/Incident Investigation:

DONALD J WILLIAMS  
5440 ROSLYN STREET  
DENVER, CO 80216