



AVIATION



HIGHWAY



MARINE



RAILROAD



PIPELINE

# Aviation Investigation Final Report

<b>Location:</b>	DALLAS, Texas	<b>Incident Number:</b>	FTW96IA210
<b>Date &amp; Time:</b>	May 10, 1996, 23:18 Local	<b>Registration:</b>	N315SW
<b>Aircraft:</b>	Boeing 737-300	<b>Aircraft Damage:</b>	Minor
<b>Defining Event:</b>		<b>Injuries:</b>	50 None
<b>Flight Conducted Under:</b>	Part 121: Air carrier - Scheduled		

## Analysis

During a visual approach to runway 31L, the flightcrew visually observed thunderstorms north of the airport, which were moving south. Also, they noted a display of the thunderstorms on their weather radar system. Light rain was encountered at 200 feet AGL. The rain intensified passing through 100 feet AGL, and the captain switched to 'high wiper.' The captain stated that, at 50 feet AGL, 'the visibility was [further] reduced by heavy rain.' After touchdown, the captain advised the first officer (who was at the controls) for a correction, to which the first officer acknowledged, 'I have full rudder input.' Subsequent to the rudder inputs, the crew 'was able to re-center the aircraft on the runway.' The flight crew of another aircraft holding at the threshold of runway 31L reported that they observed the airplane 'disappear into a wall of water' after touch down. Examination of the airplane revealed the presence of mud on the left main landing gear, wheel well, engine, and engine pylon area. Inspection of the runway revealed evidence that the left main landing gear departed the paved surface for about 700 feet. Also, 6 runway edge lights were damaged on left side of runway 31L.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this incident to be: failure of the pilot to maintain directional control and runway alignment, during the landing roll out. Factors relating to the incident were: darkness, the adverse weather condition, the wet runway, and reduced visibility due to the inadvertent encounter with heavy rain.

## Findings

Occurrence #1: ON GROUND/WATER ENCOUNTER WITH WEATHER

Phase of Operation: LANDING - FLARE/TOUCHDOWN

### Findings

1. (F) LIGHT CONDITION - DARK NIGHT
2. (F) WEATHER CONDITION - THUNDERSTORM
3. (F) WEATHER CONDITION - RAIN
4. (F) FLIGHT INTO ADVERSE WEATHER - INADVERTENT - PILOT IN COMMAND
5. (F) VISUAL/AURAL PERCEPTION

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Occurrence #2: LOSS OF CONTROL - ON GROUND/WATER

Phase of Operation: LANDING - ROLL

### Findings

6. (F) AIRPORT FACILITIES, RUNWAY/LANDING AREA CONDITION - WET
7. (C) DIRECTIONAL CONTROL - NOT MAINTAINED - COPILOT/SECOND PILOT
8. (C) PROPER ALIGNMENT - NOT MAINTAINED - COPILOT/SECOND PILOT

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Occurrence #3: ON GROUND/WATER ENCOUNTER WITH TERRAIN/WATER

Phase of Operation: LANDING - ROLL

## Factual Information

On May 10, 1996, at 2318 central daylight time, a Boeing 737-300, N315SW, registered to, and operated by Southwest Airlines Inc., as a Title 14 CFR Part 121 scheduled domestic passenger flight #768, sustained minor damage during landing roll at Dallas Love Field, Dallas, Texas. Visual meteorological conditions prevailed and an instrument flight plan was filed. The airline transport rated pilot-in-command, first officer, 3 cabin attendants, and 45 passengers were not injured. The flight originated from San Antonio International Airport, San Antonio, Texas, approximately 48 minutes prior to the incident.

According to the captain (who was not at the controls), thunderstorms (north of the airport and moving south) were visually observed and displayed on the aircraft's weather radar system. He stated that the airport was "in sight throughout the approach." After encountering light rain at about 200 feet AGL, the captain activated the windshield wipers (low setting). The rain intensified at 100 feet AGL and the captain switched to "high wiper." At 50 feet AGL, "the visibility was [further] reduced by heavy rain."

The captain further stated that after touchdown on runway 31L, he sensed a drift to the left. He then advised the first officer (who was at the flight controls and seated in the right cockpit crew station) for a correction, to which the first officer acknowledged, "I have full rudder input." The captain confirmed full rudder application with his feet. Subsequent to the rudder inputs, the crew "was able to re-center the aircraft on the runway" and the captain took control of the aircraft (normal procedure subsequent to a right seat landing/roll out). The aircraft taxied to the gate without further incident and the passengers were deplaned.

The first officer stated that runway 31L was visually acquired at approximately 8 miles and that they were cleared for a visual approach. He stated that approximately 4 to 5 miles from the runway, he "saw some obscuration of the 31L departure end runway lights." He determined that the obscuration correlated to the weather radar display and queried the captain for a possible "go-around." He further stated that "he flew the approach at Vref plus 20 knots [flaps 40 degrees] and the approach was stabilized with centered ILS." He added that there were no signs of wind shear and he was able to maintain visual contact with the approach lights and the approach end of the runway as the aircraft passed through 200 feet AGL. He added that the rain intensity continued to increase passing through 100 feet AGL. Upon touch down, he noticed the aircraft to be slightly left of centerline and corrected with right rudder input.

Southwest Airlines flight #62 (Boeing 737) was taxiing from the gate to a position near the threshold of runway 31L (time approximately 2305). The captain of flight #62 reported that, "when we got to the end of the runway, we elected to wait for some weather in our departure path." He stated that weather conditions at the time were "some rain, and a cell sitting in our departure corridor, approximately 6-7 miles [northwest] of the field." He further stated that,

after approximately 15 minutes of waiting he observed flight #768's "lights at least to the city, and approximately 10 miles out." After observing flight #768 land, he noticed "nothing unusual during the touch down." Shortly after the touch down, he observed "the aircraft disappeared into a wall of water."

Southwest Airlines flight #1134 (Boeing 737) was in sequence to land at the airport (approximately 3 minutes behind flight #768). The captain of flight #1134 reported that, while on extended final, dispatch advised that there were currently thunderstorms in the Love Field area and that they should pass in about fifteen minutes. He stated that downtown (Dallas) was visible, "but not the airfield." After being cleared to land, the captain decided to "break off the approach and go into holding until the weather had passed." While in holding approach control advised that two Southwest aircraft had landed without any problems. Subsequently, a normal approach and landing was executed in intermittent light rain and 8 knots of wind. The captain added that the runway condition was "wet but not cluttered." According to the captain, the aforementioned sequence of events occurred between approximately 2220 and 2336.

Examination of the airplane by the operator revealed the presence of mud on the left main landing gear, wheel well, engine, and engine pylon area. Inspection of the runway after the incident by airport authorities revealed evidence that the left main landing gear departed the paved surface of the runway for approximately 700 feet. Additionally, six runway edge lights (left side of the runway 31L), approximately 2100 feet south of the threshold, were found damaged.

According to weather information sources and the flight crew, visual meteorological conditions prevailed throughout the approach; however, the aircraft did encounter heavy rain and reduced visibility immediately after touch down.

### Pilot Information

<b>Certificate:</b>	Airline transport	<b>Age:</b>	49, Male
<b>Airplane Rating(s):</b>	Single-engine land; Multi-engine land	<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	Yes
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	No
<b>Medical Certification:</b>	Class 1 Valid Medical--no waivers/lim.	<b>Last FAA Medical Exam:</b>	April 23, 1996
<b>Occupational Pilot:</b>	Yes	<b>Last Flight Review or Equivalent:</b>	
<b>Flight Time:</b>	12000 hours (Total, all aircraft), 7000 hours (Total, this make and model), 7500 hours (Pilot In Command, all aircraft), 200 hours (Last 90 days, all aircraft), 70 hours (Last 30 days, all aircraft), 10 hours (Last 24 hours, all aircraft)		

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	Boeing	<b>Registration:</b>	N315SW
<b>Model/Series:</b>	737-300 737-300	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>		<b>Amateur Built:</b>	
<b>Airworthiness Certificate:</b>	Transport	<b>Serial Number:</b>	23337
<b>Landing Gear Type:</b>	Retractable - Tricycle	<b>Seats:</b>	142
<b>Date/Type of Last Inspection:</b>	Continuous airworthiness	<b>Certified Max Gross Wt.:</b>	130000 lbs
<b>Time Since Last Inspection:</b>		<b>Engines:</b>	2 Turbo fan
<b>Airframe Total Time:</b>		<b>Engine Manufacturer:</b>	GE
<b>ELT:</b>		<b>Engine Model/Series:</b>	CFM56
<b>Registered Owner:</b>	SOUTHWEST AIRLINES	<b>Rated Power:</b>	20000 Lbs thrust
<b>Operator:</b>		<b>Operating Certificate(s) Held:</b>	Flag carrier (121)
<b>Operator Does Business As:</b>		<b>Operator Designator Code:</b>	SWAA

## Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Visual (VMC)	<b>Condition of Light:</b>	Night/dark
<b>Observation Facility, Elevation:</b>	DAL ,487 ft msl	<b>Distance from Accident Site:</b>	
<b>Observation Time:</b>	22:52 Local	<b>Direction from Accident Site:</b>	
<b>Lowest Cloud Condition:</b>	Scattered / 700 ft AGL	<b>Visibility</b>	10 miles
<b>Lowest Ceiling:</b>	Overcast / 4500 ft AGL	<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	16 knots /	<b>Turbulence Type Forecast/Actual:</b>	/
<b>Wind Direction:</b>	360°	<b>Turbulence Severity Forecast/Actual:</b>	/
<b>Altimeter Setting:</b>	30 inches Hg	<b>Temperature/Dew Point:</b>	24°C / 22°C
<b>Precipitation and Obscuration:</b>	N/A - Blowing - Spray		
<b>Departure Point:</b>	SAN ANTONIO (SAT )	<b>Type of Flight Plan Filed:</b>	IFR
<b>Destination:</b>	(DAL )	<b>Type of Clearance:</b>	IFR
<b>Departure Time:</b>	22:36 Local	<b>Type of Airspace:</b>	Class B

## Airport Information

<b>Airport:</b>	DALLAS LOVE FIELD DAL	<b>Runway Surface Type:</b>	Asphalt
<b>Airport Elevation:</b>	487 ft msl	<b>Runway Surface Condition:</b>	Wet
<b>Runway Used:</b>	31L	<b>IFR Approach:</b>	
<b>Runway Length/Width:</b>	8800 ft / 150 ft	<b>VFR Approach/Landing:</b>	Full stop

## Wreckage and Impact Information

<b>Crew Injuries:</b>	5 None	<b>Aircraft Damage:</b>	Minor
<b>Passenger Injuries:</b>	45 None	<b>Aircraft Fire:</b>	None
<b>Ground Injuries:</b>	N/A	<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	50 None	<b>Latitude, Longitude:</b>	32.830875,-96.850181(est)

## Administrative Information

**Investigator In Charge (IIC):** Lemishko, Alexander

**Additional Participating Persons:** JOSEPH M MCDONALD; DFW , TX

**Original Publish Date:** February 28, 1997

**Last Revision Date:**

**Investigation Class:** [Class](#)

**Note:**

**Investigation Docket:** <https://data.nts.gov/Docket?ProjectID=19671>

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