Runway excursion, Boeing 737-3G7, August 25, 2001

Micro-summary: This Boeing 737-3G7 veered off the side of the runway during a landing in foul weather.

Event Date: 2001-08-25 at 0111 CDT

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

Investigative Body's Web Site: http://www.ntsb.gov/

Cautions:

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!***

3. Reports may or may not represent reality. Many many non-scientific factors go into an investigation, including the magnitude of the event, the experience of the investigator, the political climate, relationship with the regulatory authority, technological and recovery capabilities, etc. It is recommended that the reader review all reports analytically. Even a "bad" report can be a very useful launching point for learning.

4. Contact us before reproducing or redistributing a report from this anthology. Individual countries have very differing views on copyright! We can advise you on the steps to follow.

National Transportation Safety Board

FACTUAL REPORT AVIATION

NTSB ID: CHI01FA292	Aircraft Registration Number: N306AW
Occurrence Date: 08/25/2001	Most Critical Injury: Minor
Occurrence Type: Accident	Investigated By: NTSB

Location/Time

Nearest City/Place	State	Zip Code	Local Time	Time Zone	
Kansas City	MO	64153	0111	CDT	

Airport Proximity: On Airport	Distance From Landing Facility: 0	Direction From Airport: 0

Aircraft Information Summary

Aircraft Manufacturer	Model/Series	Type of Aircraft
Boeing	737-3G7	Airplane

Sightseeing Flight: No

Air Medical Transport Flight: No

Narrative

Brief narrative statement of facts, conditions and circumstances pertinent to the accident/incident:

NOTE: The narrative associated with this case is too large for this PDF file. Please return to the query results page and select the report under the Current Synopsis heading.

National Transportation Safety Board

FACTUAL REPORT AVIATION

NTSB ID: CHI01FA292

Occurrence Date: 08/25/2001

Occurrence Type: Accident

Landing Facility/Approach Information

Airport Name	Airport ID:	Airport Elevation	Runway Used	Runway Length	Runway Width
Kansas City International	MCI	1026 Ft. MSL	27	9500	150

Runway Surface Type: Asphalt

Runway Surface Condition: Wet

Type Instrument Approach: Visual

VFR Approach/Landing: Full Stop

Aircraft Information

Aircraft Manufacturer	Model/Series	Serial Number
Boeing	737-3G7	24633

Airworthiness Certificate(s): Transport

Landing Gear Type: Retractable - Tricycle

Homebuilt Aircraft?	Number of Seats:	Certified Max Gross Wt.	Number of Engines:
No	159	138500 LBS	2

Engine Type:	Engine Manufacturer:	Model/Series:	Rated Power:
Turbo Fan	CFM International	CFM 56-3B2	22000 LBS

- Aircraft Inspection Information

Type of Last Inspection	Date of Last Inspection	Time Since Last Inspection	Airframe Total Time
Continuous Airworthiness	08/2001	26 Hours	37875 Hours

- Emergency Locator Transmitter (ELT) Information

ELT Installed?	ELT Operated?	ELT Aided in Locating Accident Site?
No	No	No

Owner/Operator Information

Registered Aircraft Owner	Street Address	City	State	Zip Code
AMERICA WEST AIRLINES INC	4000 E. Sky Harbor Blvd.	Phoenix	AZ	85034

Operator of Aircraft	Street Address	City	State	Zip Code
Same as Reg'd Aircraft Owner	Same as Reg'd Aircraft Owner			

Operator Does Business As:

Operator Designator Code: AWXA

- 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

National Transportation Safety Board

FACTUAL REPORT AVIATION

NTSB ID: CHI01FA292

Occurrence Date: 08/25/2001

Occurrence Type: Accident

First Pilot Information

Name	City	State	Date of Birth	Age
On File	On File	On File	On File	59

Sex: M | Seat Occupied: Left | Principal Profession: Civilian Pilot | Certificate Number: On File

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? 05/2001

Medical Cert.: Class 1 | Medical Cert. Status: Valid Medical--w/ waivers/lim. | Date of Last Medical Exam: 04/2001

- Flight Time Matrix	All A/C	This Make and Model	Airplane Single Engine	Airplane Mult-Engine	Night	Instrument Actual	Instrument Simulated	Rotorcraft	Glider	Lighter Than Air
Total Time	9425									
Pilot In Command(PIC)										
Instructor										
Last 90 Days	172									
Last 30 Days	33									
Last 24 Hours										

Seatbelt Used? Yes | Shoulder Harness Used? Yes | Toxicology Performed? No | Second Pilot? Yes

Flight Plan/Itinerary

Type of Flight Plan Filed: IFR

Departure Point	State	Airport Identifier	Departure Time	Time Zone
Phoenix	AZ	PHX	2025	MST

Destination	State	Airport Identifier
Kansas City	MO	MCI

Type of Clearance: IFR

Type of Airspace: Class B

Weather Information

Source of Briefing: Company

Method of Briefing: Telephone

National Transportation Safety Board

FACTUAL REPORT AVIATION

NTSB ID: CHI01FA292

Occurrence Date: 08/25/2001

Occurrence Type: Accident

Weather Information

WOF ID	Observation Time	Time Zone	WOF Elevation	WOF Distance From Accident Site	Direction From Accident Site
MCI	0113	CDT	1026 Ft. MSL	0 NM	0 Deg. Mag.

Sky/Lowest Cloud Condition: Few 1300 Ft. AGL

Condition of Light: Night/Dark

Lowest Ceiling: Broken 1800 Ft. AGL

Visibility: 1 SM

Altimeter: 29.90 "Hg

Temperature: 22 °C

Dew Point: 22 °C

Wind Direction: 30

Density Altitude: 2124 Ft.

Wind Speed: 4

Gusts:

Weather Condtions at Accident Site: Instrument Conditions

Visibility (RVR): Ft.

Visibility (RVV) SM

Intensity of Precipitation: Heavy

Restrictions to Visibility: None

Type of Precipitation: Rain

Accident Information

Aircraft Damage: Substantial

Aircraft Fire: None

Aircraft Explosion None

Classification: U.S. Registered/U.S. Soil

- Injury Summary Matrix	Fatal	Serious	Minor	None	TOTAL
First Pilot				1	1
Second Pilot				1	1
Student Pilot					
Flight Instructor					
Check Pilot					
Flight Engineer					
Cabin Attendants				3	3
Other Crew					
Passengers			1	53	54
- TOTAL ABOARD -			1	58	59
Other Ground					
- GRAND TOTAL -			1	58	59

National Transportation Safety Board

FACTUAL REPORT
AVIATION

NTSB ID: CHI01FA292

Occurrence Date: 08/25/2001

Occurrence Type: Accident

Administrative Information

Investigator-In-Charge (IIC)

Jim Silliman

Additional Persons Participating in This Accident/Incident Investigation:

Mark Williams
FAA Inspector
FAA
10015 N. Executive Hills Blvd.
Kansas City, KS 64153

Chip Bornstein
Flight Safety Manager
America West
4000 East Sky Harbor Blvd.
Phoenix, AZ 85022

Mark Smith
Safety Investigator
Boeing
535 Garden Ave. North, MS 67-PR
Renton, WA 98055

Geoff Gray
ALPA Accident Investigator
America West
340 E. Tierra Buena Lane
Phoenix, AZ 85022

CHI01FA292

HISTORY OF FLIGHT

On August 25, 2001, at 0111 central daylight time (cdt), a Boeing 737-3G7, N306AW, Flight 598, operated by America West Airlines, Inc. (AWA), sustained foreign object damage (FOD) to both engines during landing when it veered off the left side of runway 27 (9,500 feet by 150 feet, wet grooved asphalt) at the Kansas City International Airport (MCI), Kansas City, Missouri. The captain, first officer, three flight attendants, and 53 passengers were not injured. One passenger reported a minor injury. Airport Rescue and Fire Fighting (ARFF) personnel responded and confirmed there was no smoke, fire, or fuel coming from the airplane. An emergency evacuation was not conducted. The passengers were kept on board the airplane until a bus arrived to transport them to the terminal. The Title 14 Code of Federal Regulations Part 121 scheduled, domestic flight originated from Phoenix Sky Harbor International Airport (PHX), Phoenix, Arizona, on August 24, 2001, at 2025 mountain standard time (mst), and was en route to MCI. Instrument meteorological conditions prevailed at that time. The flight was on an IFR flight plan.

The captain and first officer reported for duty at PHX on August 24, 2001, at 1340 mst for the start of a two day trip, Trip 1050. Four flight legs were scheduled on August 24th. The first scheduled takeoff was at 1425 mst, and the final landing of the fourth leg of flight occurred at 0111 cdt at MCI. The flight crew's duty time was 10 hours and 38 minutes.

On August 24, 2001, the first three flight legs on Trip 1050 were completed without incident, and the airplane arrived back at PHX at 1948 mst at the completion of the third leg of flight. The scheduled departure time for Flight 598 was 2023 mst, and the actual departure time was 2025 mst.

The pilots were interviewed by America West Airlines (AWA) personnel, representatives of the Air Line Pilots Association, and by an inspector from the Federal Aviation Administration. The AWA report stated the following information:

"The first officer was acting as the Pilot Flying (PF). The aircraft was operating normally with the exception of the auto thrust system that was placarded inoperative under the provisions of the minimum equipment list (MEL). The weather was clear until approximately 30 minutes prior to landing when the flight began deviating around convective activity using onboard weather radar and vectors from Air Traffic Control (ATC). Several runway changes were assigned by ATC. The winds were updated to approximately from the West at 8 knots and the visibility was believed to have been reported between 6 and 8 miles. ATC offered Runway 27 and the crew accepted. The first officer briefed the captain on a visual approach 'backed up by the ILS.'

The aircraft was configured for a 'flaps 30' landing and the landing checklist was completed including the arming of the speed brakes.

During the approach, the flight encountered heavy rain decreasing to light or moderate rain approximately 6 miles from the runway. The captain reported the approach lights in sight approximately 2 miles from touchdown and reported the runway lights in sight almost immediately thereafter. Between 500 and 1,000 feet above touchdown, the captain advised the first officer that the flight management system (FMS) was indicating the winds to be from 320 degrees at 8 knots.

The captain described the weather conditions 'as advertised.' The first officer indicated that the visibility was worse than he had anticipated.

On short final, the wipers were turned on and the auto brakes were set to '2.'

The first officer reported that during the flare and landing, the runway appeared to absorb the light from the aircraft's landing lights and the runway was very black. Both pilots reported the touchdown to be normal except for the absence of the sensation of touchdown. The reversers were activated normally. The crew did not recall whether or not the reverser lights came on or if the speed brakes activated.

The first officer reported that sometime after the nose wheel was lowered to the runway, he saw the left-side runway lights entering his peripheral view indicating to him that the aircraft was tracking to the left while remaining parallel to the runway centerline. The captain attempted to assist the first officer by using the steering tiller.

The aircraft exited the left side of the runway. The first officer stowed the reversers. As soon as the aircraft came to a complete stop, the captain made a public address (PA) announcement commanding the passengers to 'Remain seated, the situation is under control.' The first officer notified ATC of the situation and requested the Airport Rescue and Fire Fighting (ARFF) equipment. After the ARFF crew reported no significant hazards, the captain started the Auxiliary Power Unit (APU) until the passengers could be deplaned using portable stairs." (See AWA report of pilots' statements)

The captain in a written statement reported the following:

"I was the Captain, non-flying pilot, on flight 598 (PHX-MCI) on the night of August 24, 2001. MCI had scattered thunderstorms and rain in the area. We were vectored to the ILS for runway 27, and on final approach experienced light to moderate rain with winds reported out of the west at eight knots. I saw the approach lights at approximately two miles from the runway and the runway lights immediately thereafter. The approach and landing appeared normal; however on touchdown, the aircraft shifted to the left side of the runway and ultimately partially exited the runway into the field, despite using right aileron, rudder, and tiller inputs. Once stopped, we contacted the tower and asked for emergency vehicles, and then notified the Company. Passengers were de-planed by emergency crews and aircraft control handed off the MCI station personnel."

The first officer in a written statement reported the following:

"I was the First Officer, flying pilot, on flight 598 (PHX-MCI) on the night of August 24, 2001. We were vectored to the ILS for runway 27, and on final approach experienced light to moderate rain. Upon touchdown, the aircraft gently began to shift to the left edge of the runway and ultimately partially exited the runway into the field, despite using right aileron and rudder inputs. Once stopped, we contacted the tower and asked for emergency vehicles, and then notified the Company. Passengers were de-planed by emergency crews and aircraft control handed off to MCI station personnel."

One of the flight attendants reported the following in a written statement:

"As we were approaching the runway in Kansas City the first flight attendant and I noticed it was raining pretty hard outside, but other than that everything seemed normal. Once we touched down I felt a few

bumps and then the plane seemed to skid. At that point I felt a huge bump and a few seconds later we came to a stop. The first [flight attendant] called the flight deck after waiting a few seconds. As soon as she called the flight deck one of the pilots came over the PA and said, 'Remain seated. Situation under control.' The passengers were the first ones to mention we might be off the runway. While I was talking to the passengers from my jump seat the first flight attendant was busy talking to the pilots. The emergency crew at Kansas City arrived on the scene in less than a minute. With the help of the America West personnel in MCI and the emergency crew, the passengers deplaned out of door 1R, down portable stairs and on to waiting buses that took them to the terminal."

PERSONNEL INFORMATION

The captain held an airline transport pilot certificate with airplane single engine and multi-engine land ratings. He held a First Class Medical Certificate that was issued on April 17, 2001. He had a total of about 9,425 flight hours. He had flown 172 hours in the last 90 days and 33 hours in the last 30 days.

The first officer held an airline transport pilot certificate with airplane single engine and multi-engine land ratings. He held a First Class Medical Certificate that was issued on December 12, 2000. He had a total of about 11,740 flight hours. He had flown 238 hours in the last 90 days and 51 hours in the last 30 days.

AIRCRAFT INFORMATION

The airplane was a Boeing 737-3G7, serial number 24633. The CFM 56-3B2 engines delivered 22,000 pounds of thrust each. The airplane's last maintenance inspection was a continuous airworthiness inspection conducted on August 22, 2001. The airplane had flown 26 hours since the last inspection, and had a total time of 37,878 hours.

The airplane had a maximum gross weight of 138,500 lbs. An AWA engineer reported that based on an estimated landing weight of 95,071 lbs. and a landing index of 56.7, the %MAC [mean aerodynamic chord] was approximately 17.4%. This information was predicted upon the planned trip fuel burn of 13,100 lbs.

METEOROLOGICAL CONDITIONS

At 0031 cst, the Automatic Terminal Information Service (ATIS) information Quebec was: winds 040 degrees at 5 knots, 7 miles visibility, thunderstorm and light rain, few clouds at 2,000 feet, ceiling 6,000 broken cumulonimbus, 9,000 feet overcast, temperature 23 degrees [Celsius], dew point 22 degrees [Celsius]., altimeter 29.87. Remarks: Frequent lightning in clouds, clouds to ground all quadrants, thunderstorm overhead moving northeast. Runway use program in effect. Arrivals expect visual approach runway 19L.

At 0054 cst, ATC issued the flightcrew a weather update, which was: "few clouds at 1,200 feet, ceiling 6,000 feet broken, 8,500 feet overcast, visibility 10 miles light rain. Wind three six zero at eight, altimeter 29.88." The controller subsequently issued the flightcrew windshear alerts of 20 knots within 2 miles of the airport and heavy rain at the airport.

At 0113 cst, the special weather observation at MCI was: winds 030 at 4 knots, 1 mile visibility, heavy thunderstorms and rain showers, mist, few clouds at 1,300, broken layer at 1,800 feet, overcast 7,000 feet, cumulonimbus clouds, temperature 22 degrees C, dew point 22 degrees C, altimeter 29.90. Remarks:

thunderstorm began 0106. Frequent lightning in cloud cloud to ground cloud to cloud cloud to air all quadrants. Thunderstorm overhead moving northeast.

The Automated Surface Observation Systems (ASOS) winds reported at 0100 were variable at 4 knots gusting to 15 knots. The ASOS winds reported at 0105 were variable at 4 knots. The ASOS winds reported at 0110 were 260 degrees at 5 knots. The ASOS winds reported at 0115 were 030 degrees at 6 knots.

The ASOS rain gauge (located about 8,000 feet west-northwest from the touchdown point) data indicated that 0.42-inch of rain fell between 0100 and 0111. The ASOS one-minute precipitation values during the period from 0100 to 0113, were:

Time Rain (inches)

0100 0.00

0101 0.01

0102 0.04

0103 0.02

0104 0.03

0105 0.03

0106 0.06

0107 0.02

0108 0.01

0109 0.05

0110 0.07

0111 0.08

0112 0.03

0113 0.02

The National Weather Service weather radar and the FAA Terminal Doppler Weather Radar indicated that level 4 and level 5 thunderstorms were present in the vicinity of MCI at the time of the accident.

Convective SIGMET 16C, issued August 24, 2255 cdt, and valid until August 25, 0055 cdt, stated the following information that covered Missouri, Kansas, and Nebraska: From 40SSE SLN-60E ICT-70NE GAG-50ESE GCK-40SSE SLN. Area severe thunderstorms move from 330 degrees at 20 knots. Tops

above FL450. Hail to 1 inch…wind gusts to 50 knots possible. (See National Transportation Safety Board (NTSB) Meteorology Factual Report)

RUNWAY INFORMATION

Runway 27 at MCI is a 9,500 feet by 150 feet grooved asphalt runway with a one-degree transverse slope crowned at the centerline. At 3,200 feet from the threshold, the white edge stripe defining the official edge of the runway is 73 feet from the centerline. A paved shoulder varies along the length of the runway, and has an unknown slope. The transverse grooves in the pavement extend to a width of 65 feet from runway centerline. The runway surface beyond a width of 65 feet to the pavement edge is un-grooved pavement with an unknown slope. (See Boeing Letter, dated November 12, 2001.)

FLIGHT RECORDERS

The NTSB Cockpit Voice Recorder (CVR) Group Chairman's Factual Report stated, "The recording appeared to start approximately fifteen minutes after the accident while passengers were still on the aircraft and continued until they had deplaned. Very little conversation between crewmembers was recorded. The recording ended as the crew left the cockpit." (See NTSB CVR Group Chairman's Factual Report)

The Flight Data Recorder (FDR) was sent to the NTSB Vehicle Recorders Division for readout. The readout of the FDR revealed the following:

1. At 189846 seconds, the autopilot was disengaged.

2. Over the next several seconds, glideslope and localizer deviation values increased with localizer deviation reaching 0.4 dots (right) at 189859 seconds and glideslope deviation reaching 2.7 dots (up) the following second.

3. At 189877 seconds, with a groundspeed of 129 knots and a magnetic heading of 269.6º, vertical acceleration increased to 1.401 g's, consistent with touchdown.

4. The following second, the value for spoiler number 2 was recorded as 19.7º. One second later, the value for spoiler number 7 was 24.6º. Also during this timeframe, the FDR indicated the left and right thrust reversers for both engines were deployed.

5. At 189880 seconds and for the following two seconds, rudder pedal position indicated input from the right pedal, followed by the left pedal, and then the right pedal. Recorded values for rudder position during this time are consistent with these rudder pedal movements.

6. The airplane's heading increased to the right, reaching 278.8º at 189881 seconds while the airplane experienced 0.304 g's of lateral acceleration to the right.

7. At 189882 seconds, longitudinal acceleration reached -0.670 g's and the airplane had a left roll angle of 3.5º.

8. The following second, the airplane rolled to the right 2.5º, while vertical acceleration dropped to its lowest value of 0.151 g's and then increased to its highest value of 1.668 g's.

9. Magnetic heading continued to increase, reaching 284.1º at 189891seconds. Two seconds later, groundspeed indicated the airplane came to rest. (See the NTSB Specialist's Factual Report of Investigation Solid State Digital Flight Data Recorder Report)

WRECKAGE AND IMPACT INFORMATION

The inspection of runway 27 revealed tire skid marks 3,201 feet from the threshold of runway 27. They were 90 feet long. They began about 53 feet left of the runway centerline and they ended 62 feet 11 inches from centerline. One of the skid marks crossed over the base of a broken taxiway light. The left main landing gear skid mark left the pavement for the first time at 4,157 feet from the runway threshold and 103 feet 4 inches from the centerline. It was on the southwest side of Echo Taxiway and the runway 9/27 intersection. The left skid marks were not visible on Foxtrot taxiway that crossed runway 27. The left main landing gear tire mark reappeared in the grass 15 feet west of the Foxtrot taxiway skirt. The right main landing gear left the pavement of the runway skirt at 4,673 feet from the runway threshold and 97 feet 8 inches from the runway centerline. The airplane came to a rest at 5,213 feet from the threshold of runway 27.

The inspection of the airplane revealed that both engines received foreign object damage (FOD).

TESTS AND RESEARCH

The NTSB provided the Boeing Company with the raw data from the FDR. The Boeing review of the FDR data revealed that the airplane was on a stabilized approach with the autopilot engaged. About 200 feet above ground level (agl), the autopilot was disconnected and the airplane was flown manually. After the autopilot disconnect, the airplane began drifting left and above glide slope. The airplane crossed the runway threshold about 57 feet agl, offset about 65 feet left of centerline, but the ground track was being corrected back toward centerline. A flare was initiated about 600 feet from the runway threshold and about 35 feet agl. During the flare, the ground track achieved the centerline, but deviated back to the left before main gear touchdown, which occurred about 3,200 feet from the runway threshold. At touchdown, the left main gear was about 56 feet left of centerline with an airplane ground track of about 5 degrees to the left. Within 2 seconds of touchdown (about 300 feet of travel), the left main gear crossed the white runway edge stripe, and within 5 seconds of touchdown (about 1,000 feet of travel), the left main gear departed the paved surface. A nearly full right rudder input was made about 3,450 feet from the runway threshold after main gear touchdown. The airplane departed the runway surface before the ground track altered back to the right.

The Boeing report also stated that the FDR data indicated the flight spoiler deployment after touchdown was about half the expected deflection. An inspection revealed the speedbrake lever cable was miss-rigged, which caused the partial deployment of the speed brake lever by the auto-speedbrake actuator. It was confirmed that the speed brake lever traveled far enough to deploy the ground spoilers. The pilots reported they had set Auto-Brakes 2. The FDR data indicated a longitudinal deceleration profile from touchdown to pavement exit that was consistent with the Auto-Brakes 2 setting. This implies that hydroplaning was not occurring and that partial flight spoiler deployment did not adversely affect landing performance. (See Boeing Letter dated November 12, 2001)

A representative from the Michelin Tire Company examined the four Michelin H40x14.5-19/24.225 main landing gear tires that were removed from the airplane for inspection. The tires were still mounted to their

wheels. He reported, "I observed no rubber reversion on any tire. There was no evidence of viscous hydroplaning or dynamic hydroplaning… . Significant cuts, tears and chunking, however, were seen on the tires. This FODing was the result, I was told, of the airplane rolling over a raised concrete curb during its departure from the paved runway."

A Senior Research Engineer from the NASA Langley Research Center, Structural Dynamics Branch, examined the data that concerned hydroplaning and reported the following:

"I do not think viscous or dynamic hydroplaning and/or reverted rubber skidding were significant factors in this incident because:

1) Tire photographs that I saw and the Michelin tire representative's inspection of the actual tires indicated no evidence of tread reversion on any landing gear tires.

2) Tire inflation pressure does play a major role in dynamic hydroplaning development but the runway surface type and cross-slope, the direction of the crosswind, and the recorded rainfall amounts would not contribute to a flooded (greater than 0.1 in. water depth) runway condition.

3) Viscous hydroplaning and reverted rubber skidding both require a very smooth, low macrotexture pavement surface such as possibly the white runway shoulder paint stripe but the incident aircraft tires were on this paint stripe a relatively short time in respect to the total time from touchdown to a stop.

4) Worn tire treads are more susceptible to hydroplaning than new tires but lack of vertical load, i.e., less than full spoilers, on these tires could be a much greater factor in determining the amount of braking and steering forces."

The America West Airlines B-737 Fleet Manager reported the following information concerning the aircraft's weather radar system:

"Although the crew of flight 598 did not report a problem with the radar, I noted a possible discrepancy during the reposition flight to PHX. The radar return appeared weak while painting weather returns. Ground returns appeared normal. The radar was removed for bench testing and no discrepancies were noted."

The America West Airlines B737 Operations Manual, Supplementary Normal Procedures, states the following information for Landing on Wet or Slippery Runways:

"Refer to AWA Performance Book for definitions and limitations of wet or slippery runways.

Operate the airplane during the approach in a way that will minimize stopping requirements after touchdown without running the risk of landing short.

Maintain close control over approach speeds and maintain recommended speeds for the current conditions. The recommended wind additives (1/2 the steady wind plus all the gust factor to a maximum of 20 knots) provide adequate safety margins for both the approach and the landing roll.

Control Glidepath so that touchdown occurs on the 1000 foot point (Fixed Distance Marker). The airplane should be flown firmly onto the runway at the aiming point even if airspeed is excessive. If an

unsatisfactory approach is likely to result in a long landing, GO AROUND and make a second approach. Once the aircraft has been landed and stopping efforts begun, a go-around attempt is not recommended.

WARNING

A full stop landing must be made after thrust reverse has been initiated. Do not attempt a go-around!

If the wing anti-ice system is inoperative and large ice formations exist on the wing leading edge devices add 10 knots to the reference speed to maintain normal handling characteristics."

The America West Airlines B737 Operations Manual, Normal Procedures, states the following information for Approach Gate/Approach Requirements:

"The approach gate is a point 500 feet above TSZE (VMC) or 500 feet above minimums (IMC) at which point the aircraft must be configured for landing, on speed and be in position to land.

After the approach gate, the PNF will alert the PF when any deviation limit is approached by stating, 'LOCALIZER,' 'GLIDESLOPE,' 'AIRSPEED,' 'SINK RATE,' OR 'ALTITUDE' (AS APPROPRIATE). An immediate go-around will be executed if any of the deviation limits listed below are exceeded.

VMC:

Airspeed 10 knots below or above target (momentary excursions from these values are acceptable under gusty wind conditions).

Greater that 1000 fpm sink rate, unless briefed for a greater fpm descent.

IMC:

Airspeed 10 knots below or above target (momentary excursions from these values are acceptable under gusty wind conditions).

Airspeed below Vref.

Greater than 1000 fpm sink rate, unless briefed for a greater fpm descent.

Localizer displacement more than 1 dot.

Glideslope displacement greater than 1 dot.

Any navigation radio or flight instrument failure which will affect the ability to safely complete the approach.

Flight instrument crosscheck shows significant disagreement.

CAUTION

Ducking below the G/S is NOT acceptable. During low visibility approaches, it may cause high rates of descent which are not readily apparent from airspeed or vertical speed indications and may not be noticed until too late."

ADDITIONAL INFORMATION

Parties to the investigation included the Federal Aviation Administration, America West Airlines, The Boeing Company, and the Air Lines Pilots Association.

Use your browsers 'back' function to return to synopsis
Return to Query Page