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## Turbulence injury, Boeing 737-2H4, July 7, 1994

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**Micro-summary:** This Boeing 737-2H4 encountered turbulence during descent, seriously injuring a flight attendant.

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**Event Date:** 1994-07-07 at 1659 CDT


**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!***
  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.
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|  |  |                                 |                                  |                                     |                  |
|--|--|---------------------------------|----------------------------------|-------------------------------------|------------------|
|    |  | NTSB ID: FTW94LA229             |                                  | Aircraft Registration Number: N60SW |                  |
|  |  | Occurrence Date: 07/07/1994     |                                  | Most Critical Injury: Serious       |                  |
|  |  | Occurrence Type: Accident       |                                  | Investigated By: NTSB               |                  |
| Location/Time  |  |                                 |                                  |                                     |                  |
| Nearest City/Place<br>SOUTH BEND   |  | State<br>IN                     | Zip Code<br>46600                | Local Time<br>1659                  | Time Zone<br>CDT |
| Airport Proximity: Off Airport/Airstrip  |  | Distance From Landing Facility: |                                  | Direction From Airport:             |                  |
| Aircraft Information Summary   |  |                                 |                                  |                                     |                  |
| Aircraft Manufacturer<br>BOEING  |  | Model/Series<br>737-2H4         |                                  | Type of Aircraft<br>Airplane        |                  |
| Sightseeing Flight: No   |  |                                 | Air Medical Transport Flight: No |                                     |                  |
| Narrative  |  |                                 |                                  |                                     |                  |
| <p>Brief narrative statement of facts, conditions and circumstances pertinent to the accident/incident:</p> <p>On July 7, 1994, at 1659 central daylight time, a Boeing 737-2H4, N60SW, encountered moderate turbulence near South Bend, Indiana. One flight attendant was seriously injured. Four crew members and 100 passengers were not injured. Instrument meteorological conditions (IMC) prevailed for Southwest Airlines Flight 1490, scheduled Title 14 CFR Part 121 flight to Cleveland-Hopkins International (CLE) Airport, Ohio.</p> <p>According to the pilot/operator report, radar was used to avoid weather as the aircraft approached South Bend, Indiana. There had been no pilot reports of turbulence and the company dispatcher weather package did not report turbulence. As the flight climbed through FL200, moderate turbulence was encountered for several seconds. The aircraft then entered visual meteorological conditions and smooth air.</p> <p>The captain stated that the unexpected turbulence started and stopped so quickly that he did not have time to warn the flight attendants. A flight attendant in the aft galley fell to the floor injuring her back. A paramedic on the flight assisted the flight attendant. The seat belt sign was illuminated at the time the turbulence was encountered.</p> <p>The captain made the decision to continue to their destination because the weather they had passed through was getting worse, and the flight attendant's injury was not thought to be severe. As the flight approached Cleveland (CLE) thunderstorms were developing over the airport causing landing delays, so the flight was diverted to Detroit Metropolitan Wayne County Airport, Detroit, Michigan. Paramedics met the airplane at the gate and transported the flight attendant to the hospital.</p> |  |                                 |                                  |                                     |                  |
| FACTUAL REPORT - AVIATION  |  |                                 |                                  |                                     |                  |
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| <br><b>National Transportation Safety Board</b><br><b>FACTUAL REPORT</b><br><b>AVIATION</b> |                             | NTSB ID: FTW94LA229                            |                                |                        |              |
|  |                             | Occurrence Date: 07/07/1994                    |                                |                        |              |
|  |                             | Occurrence Type: Accident                      |                                |                        |              |
| <b>Landing Facility/Approach Information</b>   |                             |  |                                |                        |              |
| Airport Name   | Airport ID:                 | Airport Elevation<br>Ft. MSL                   | Runway Used<br>0               | Runway Length          | Runway Width |
| Runway Surface Type:   |                             |  |                                |                        |              |
| Runway Surface Condition:  |                             |  |                                |                        |              |
| Type Instrument Approach: NONE   |                             |  |                                |                        |              |
| VFR Approach/Landing:  |                             |  |                                |                        |              |
| <b>Aircraft Information</b>  |                             |  |                                |                        |              |
| Aircraft Manufacturer<br>BOEING  |                             | Model/Series<br>737-2H4                        |                                | Serial Number<br>21812 |              |
| Airworthiness Certificate(s): Normal   |                             |  |                                |                        |              |
| Landing Gear Type: Retractable - Tricycle  |                             |  |                                |                        |              |
| Homebuilt Aircraft? No   | Number of Seats: 130        | Certified Max Gross Wt.                        | 115500 LBS                     | Number of Engines: 2   |              |
| Engine Type:<br>Turbo Fan  | Engine Manufacturer:<br>P&W | Model/Series:<br>JT8D-9(A)                     | Rated Power:<br>14500 LBS      |                        |              |
| - Aircraft Inspection Information  |                             |  |                                |                        |              |
| Type of Last Inspection<br>Continuous Airworthiness  | Date of Last Inspection     | Time Since Last Inspection<br>Hours            | Airframe Total Time<br>Hours   |                        |              |
| - Emergency Locator Transmitter (ELT) Information  |                             |  |                                |                        |              |
| ELT Installed?   | ELT Operated?               | ELT Aided in Locating Accident Site?           |                                |                        |              |
| <b>Owner/Operator Information</b>  |                             |  |                                |                        |              |
| Registered Aircraft Owner<br>SOUTHWEST AIRLINES, CO.   |                             | Street Address<br>2832 SHORECREST DRIVE        |                                |                        |              |
|  |                             | City<br>DALLAS                                 | State<br>TX                    | Zip Code<br>75235      |              |
| Operator of Aircraft<br>Same as Reg'd Aircraft Owner   |                             | Street Address<br>Same as Reg'd Aircraft Owner |                                |                        |              |
|  |                             | City   | State                          | Zip Code               |              |
| Operator Does Business As: SOUTHWEST AIRLINES  |                             |  | Operator Designator Code: SWAA |                        |              |
| - 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  |                             |  |                                |                        |              |

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|  <p><b>National Transportation Safety Board</b><br/><b>FACTUAL REPORT</b><br/><b>AVIATION</b></p> | NTSB ID: FTW94LA229         |
|  | Occurrence Date: 07/07/1994 |
|  | Occurrence Type: Accident   |

**First Pilot Information**

|                 |                 |                  |                          |           |
|-----------------|-----------------|------------------|--------------------------|-----------|
| Name<br>On File | City<br>On File | State<br>On File | Date of Birth<br>On File | Age<br>40 |
|-----------------|-----------------|------------------|--------------------------|-----------|

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

Certificate(s): Airline Transport

Airplane Rating(s): Multi-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? |
|---|---------------------------------|

|                        |  |                                    |
|------------------------|--|------------------------------------|
| Medical Cert.: Class 1 | Medical Cert. Status: Valid Medical--no waivers/lim. | Date of Last Medical Exam: 05/1994 |
|------------------------|--|------------------------------------|

| - 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            | 8000    | 5000                | 2000                   | 6000                  | 1000  | 2000       | 100       |            |        |                  |
| Pilot In Command(PIC) | 3500    | 300                 | 1900                   | 1300                  | 100   | 200        | 20        |            |        |                  |
| Instructor            | 1500    |                     | 500                    | 1000                  | 20    | 20         |           |            |        |                  |
| Last 90 Days          | 260     | 260                 |                        | 260                   | 50    | 50         | 2         |            |        |                  |
| Last 30 Days          | 85      | 85                  |                        | 85                    | 10    | 5          | 2         |            |        |                  |
| Last 24 Hours         | 1       | 1                   |                        | 1                     |       |            |           |            |        |                  |

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

**Flight Plan/Itinerary**

Type of Flight Plan Filed: IFR

|                            |             |                           |                        |                  |
|----------------------------|-------------|---------------------------|------------------------|------------------|
| Departure Point<br>CHICAGO | State<br>IL | Airport Identifier<br>MDW | Departure Time<br>1610 | Time Zone<br>CDT |
| Destination<br>CLEVELAND   | State<br>OH | Airport Identifier<br>CLE |                        |                  |


Type of Clearance: IFR

Type of Airspace: Class A; Class E

**Weather Information**

Source of Briefing:  
Company; Commercial Weather Service

Method of Briefing:

|  |                             |
|--|-----------------------------|
|  <p><b>National Transportation Safety Board</b><br/><b>FACTUAL REPORT</b><br/><b>AVIATION</b></p> | NTSB ID: FTW94LA229         |
|  | Occurrence Date: 07/07/1994 |
|  | Occurrence Type: Accident   |

|                                     |                       |  |                  |                                 |                              |
|-------------------------------------|-----------------------|--|------------------|---------------------------------|------------------------------|
| <b>Weather Information</b>          |                       |  |                  |                                 |                              |
| WOF ID                              | Observation Time      | Time Zone  | WOF Elevation    | WOF Distance From Accident Site | Direction From Accident Site |
|                                     | 0000                  |  | 0 Ft. MSL        | 0 NM                            | 0 Deg. Mag.                  |
| Sky/Lowest Cloud Condition: Unknown |                       |  | 0 Ft. AGL        | Condition of Light: Day         |                              |
| Lowest Ceiling: Unknown             |                       | 0 Ft. AGL  | Visibility: 0 SM | Altimeter: 29.00                | "Hg                          |
| Temperature: °C                     | Dew Point: °C         | Wind Direction:  |                  | Density Altitude: Ft.           |                              |
| Wind Speed:                         | Gusts:                | Weather Conditions at Accident Site: Instrument Conditions |                  |                                 |                              |
| Visibility (RVR): 0 Ft.             | Visibility (RVV) 0 SM | Intensity of Precipitation: Light                          |                  |                                 |                              |
| Restrictions to Visibility: None    |                       |  |                  |                                 |                              |
| Type of Precipitation: Rain         |                       |  |                  |                                 |                              |

|                             |                     |                          |
|-----------------------------|---------------------|--------------------------|
| <b>Accident Information</b> |                     |                          |
| Aircraft Damage: None       | 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                          |       | 1       |       | 2    | 3     |
| Other Crew                                |       |         |       |      |       |
| Passengers                                |       |         |       | 100  | 100   |
| - TOTAL ABOARD -                          |       | 1       |       | 104  | 105   |
| Other Ground                              | 0     | 0       | 0     |      | 0     |
| - GRAND TOTAL -                           | 0     | 1       | 0     | 104  | 105   |

National Transportation Safety Board

**FACTUAL REPORT**

**AVIATION**



NTSB ID: FTW94LA229

Occurrence Date: 07/07/1994

Occurrence Type: Accident

Administrative Information

Investigator-In-Charge (IIC)

DOUGLAS D. WIGINGTON,

Additional Persons Participating in This Accident/Incident Investigation:

DONALD F WHITE

FAA FSDO

DFW AIRPORT, TX 75261