NATIONAL TRANSPORTATION SAFETY BOARD
Office of Aviation Safety
Washington, D.C. 20594

January 2, 2013

Group Chairman's Factual Report

OPERATIONAL FACTORS

DCA12FA062

Contents

A. ACCIDENT

Operator:	U S Airways, Inc.
Location:	descending into Denver International Airport (DEN), Denver, CO in the vicinity of Buena Vista, CO
Date:	April 14, 2012
Time:	2340 Mountain Daylight Time[1] (MDT)
Aircraft:	Airbus A-319-132, Registration: N808AW, Serial #1088

B. OPERATIONAL FACTORS GROUP

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C. SUMMARY

On 14 April 2012, at approximately 2340 mountain daylight time, an Airbus Industries A319-132, US registration N808AW, operated by US Airways as flight 496 from PHX to DEN, encountered severe mountain wave turbulence at flight level 320 in the vicinity of Buena Vista, CO. Two flight attendants and four passengers were injured during the encounter. No turbulence had been reported previously. The flight continued to DEN, and landed normally.

D. DETAILS OF THE INVESTIGATION

The Operations Group conducted phone interviews[2] with both US Airways accident crew members on May 7, 2012. The group gathered accident information including flight plan, weight and balance info, weather information, copies of messages that occurred on the accident flight between the crew and the company. The group also gathered and reviewed Flight Operations Manual (FOM) and the US Airways A319/320/321 Pilot Handbook.

[1] All times are Mountain Daylight Time (MDT) based on a 24-hour clock, unless otherwise noted.
[2] See attachment 1 – Interview Summaries

E. FACTUAL INFORMATION

1.0 History of Flight

On April 14, 2012, U S Airways flight #496 departed Phoenix Sky Harbor International Airport (PHX), Phoenix, Arizona at approximately 2245 MDT for a flight to Denver International Airport, Denver, Colorado. There were 93 passengers onboard in addition to 2 pilots and 3 flight attendants (F/A). The captain was the pilot monitoring (PM) and the first officer (F/O) was the pilot flying (PF).

The captain said there was nothing unusual about the weather information in his departure paperwork and said it was a "straight forward" weather package. The captain reviewed the weather information for the flight including the flight plan turbulence plots[3] in the flight release paperwork. The crew stated the flight plan had all "zeros" in the turbulence plots which meant no turbulence was indicated. The captain said a zero on the turbulence plot indicated no turbulence and a four would indicate moderate turbulence. The captain reviewed the turbulence plots with the F/As during his pre-flight briefing to them and briefed the F/As there should be no problem getting into DEN. The F/O also reviewed the turbulence plots and agreed it contained no indications of turbulence. The F/O said that information agreed with what he knew since he had just commuted into PHX on a flight from DEN and the flight was smooth.

The takeoff, climb and cruise portions of the flight were normal. The crew stated that they had a "smooth" ride with clear visibility and were in visual meteorological conditions (VMC) as they cruised at flight level (FL) 390[4]. The captain said he decided to leave the seat belt sign on for the entire flight to allow the F/As to perform their service. The seat belt sign was on at the time of the event.

The flight was cleared to descend from FL390 to 17,000 feet. The F/O said the autopilot was engaged but he was commanding the descent manually. During the descent, the captain said he turned on the cockpit weather radar and noted no significant radar returns between their position and DEN.

The F/O said at the time of the event, he was momentarily "heads down" getting some information for the captain. At approximately FL320, the captain noticed the airspeed was increasing and said he knew it was going to go into the overspeed region. The captain disconnected the autopilot and began to manually pitch up the nose of the airplane and called out "overspeed". The F/O said he noticed the airspeed headed toward redline[5] on the airspeed indicator and since he was the PF, he "acted" and got on the flight controls and pitched the airplane to about 7 to 10 degrees nose up while trying to maintain a wings level attitude. When both pilots made inputs on the flight controls at the same time, the airplane responded by aurally announcing "dual input". The captain said when he heard the "dual input" alert, he released the flight controls. Even though the airplane was pitched nose up, the airplane began to overspeed and then encountered severe turbulence. The captain said that as the airspeed was increasing; the ride was "smooth" until they hit the turbulence. The F/O was the only person on the flight

[3] See Section 5.0 – Turbulence Plots in this report.
[4] FL390 was 39,000 feet altitude.
[5] Redline – a red line indicator on the airspeed indicator that indicted when an overspeed condition was reached.

controls when the flight encountered turbulence. During the turbulence encounter, the airplane descended approximately 2,000 feet.

The captain said there were no pilot reports (PIREPs) or air traffic control (ATC) reports of weather prior to the event and there was no warning before they were "jolted" by the turbulence.

After the turbulence encounter, the crew noticed that the ELAC[6] 1 and 2 had faulted due to the "out of normal" gravity loads they had experienced. The captain corrected the ELAC faults using the ECAM[7] procedure.

The crew reported to ATC that they had encountered a severe mountain wave and could not control their airspeed during the encounter. ATC replied that was the first report they had of turbulence in the area. The crew decided to keep the airspeed at 260 knots because of the possibility of damage to the airplane. The crew said the airplane "seemed to fly okay".

The captain thought some passengers might have gotten hurt and called the "A" F/A to assess the damage. The "A" F/A said there were four passengers, who had not been wearing their seatbelts, that were hurt and two of those passengers had hit the ceiling during the turbulence. The "A" F/A said she was in her seat when they encountered the turbulence. The "A" F/A said she could see "bodies" on the floor of the aft galley and reported to the captain that there were two F/As injured. She said the injured F/As had been on their aft jumpseat but did not have their seatbelts on when they encountered turbulence. She thought one F/A had possibly broken an arm. She said a doctor and nurse who were on board attended to the injured F/As.

The captain informed company dispatch through the ACARS[8] system that they had encountered severe turbulence and would need paramedics. Dispatch said they had no reports of turbulence in the area.

The captain declared a medical emergency to air traffic control and requested paramedics to meet the flight. The captain said there was no problem with ATC getting the flight on the ground quickly. Paramedics met the flight and transported the two flight attendants and one of the injured passengers to the hospital.

2.0 Flight Crew Information

The US Airways accident flight crew consisted of a pilot-in-command (PIC) and second-in-command (SIC).
Both crewmembers were current and qualified under US Airways and FAA requirements.

2.1 Pilot-in-Command (PIC) Rory Dale Higman, Captain U S Airways

Captain Higman was 46 years old.
Date of hire with U S Airways was January 19, 1995.

[6] ELAC – elevator aileron control computer.
[7] ECAM – electronic centralized aircraft monitor.
[8] ACARS - ARINC Communications Addressing and Reporting System.

2.1.1 Captain Higman's Pilot Certificates and Ratings Held at Time of the Accident

AIRLINE TRANSPORT PILOT (issued January 18, 2003)
AIRPLANE MULTIENGINE LAND
CE-560XL A-320 BE-1900 DHC-8 BE-300
COMMERCIAL PILOT PRIVILEGES
AIRPLANE SINGLE ENGINE LAND
BE-300 AND BE-1900 SECOND IN COMMAND REQUIRED

FLIGHT INSTRUCTOR (issued September 15, 1993)
AIRPLANE SINGLE ENGINE

GROUND INSTRUCTOR (issued June 29, 1987)
ADVANCED INSTRUMENT

MEDICAL CERTIFICATE FIRST CLASS (issued February 21, 2012)
Limitations: Must wear Corrective Lenses[9].

2.1.2 Captain Higman's Certification Record

FAA records of the PIC indicated that:

Private Pilot - Airplane Single Engine Land certificate was originally issued on January 19, 1985. An Instrument Airplane rating was added on June 9, 1987.

Commercial Pilot – Airplane Single Engine Land – Instrument Airplane certificate was originally issued on August 21, 1987. Multiengine privileges were added on April 20, 1989.

Airline Transport Pilot –Airplane Multiengine Land – BE-300 BE-1900 – Commercial Privileges – Airplane Single Engine Land – BE-300 BE-1900 Second-In-Command Required certificate was originally issued on March 30, 1990. DHC-8 rating was added on April 1, 1991. A-320 rating was added on February 13, 1996. CE-560XL rating was added on January 18, 2003.

Ground Instructor -Instrument certificate was originally issued on June 22, 1987.

Ground Instructor – Advanced Instrument certificate was originally issued on June 29, 1987.

Flight Instructor – Airplane Single Engine certificate was originally issued on September 30, 1987.

A Notice of Disapproval was issued on June 5, 1987 when he failed portions of the flight test for his Private Pilot – Instrument Airplane rating. He was retested and passed on June 9, 1987.

[9] The captain stated he was wearing his glasses at the time of the event.

A Notice of Disapproval was issued on April 6, 1989 when he failed the engine failure procedures portion of his flight test for a Multiengine rating. He was retested and issued the certificate on April 20, 1989.

A review of FAA records found no prior accident, incident or enforcement actions.

2.1.3 Captain Higman's Training and Proficiency Checks Completed

Date originally upgraded to Captain: May 18, 2004
Date upgraded to Captain on the Airbus A319/A320/A321: May 18, 2004
Initial Type Rating on the Airbus A319/A320/A321: February 13, 1996
Last recurrent ground training: May 14, 2011
Last Proficiency Check in Airbus A319/A320/A321: May 15, 2011
Last PIC Line Check: May 16, 2011

U S Airways reported that Captain Higman had no record of failures during company training.

Captain Higman said he had an incident in February 1987 when he was being trained in instrument flying. He was flying a Cessna 182RJ was unable to get the nose gear to extend.

He had no previous accidents or violations.

A review of FAA NPTRS[10] records for Captain Higman was unremarkable.

2.1.4 Captain Higman's Flight Times[11]

Total pilot flying time	About 9,300 hours
Total PIC Time	About 8,500 hours
Total Airbus A319/A320/A321 flying time	About 5,300 hours
Total A319/A320/A321 PIC time	About 4,600 hours
Total flying time last 24 hours	About 1 hour
Total flying time last 30 days	About 54 hours
Total flying time last 90 days	About 141 hours

2.1.5 Captain Higman's Reported Activities

Captain Higman reported his activities during an interview:

On the day of the accident, Saturday, April 14, 2012.

- He was at his commuter pad in in Phoenix, AZ. He awoke about 0730 Mountain Standard Time (MST)[12] after he slept "good".

[10] NPTRS – National Program Tracking and Reporting Subsystem

[11] Approximate based on U S Airways employment records and interviews.

- During the day, he was at the house of a friend in Phoenix, AZ and worked on a project to repair a radio.
- He was on reserve[13] for the day.
- The accident trip was available in open flying so he "picked up" the trip.
- He took a nap in the afternoon.
- He departed for the airport at about 1930 MST for a 2045 MST show time for the trip.
- The accident occurred on the first flight of the first day of a planned four day trip.

The day before the accident, Friday, April 13, 2012.

- He awoke about 0730 MST.
- He was on reserve in Phoenix from 1300 MST to 2300 MST
- He had "normal activities" during the day.
- He went to bed at about 2200 to 2230 MST.

Two days before the accident, Thursday, April 12, 2012.

- He was at his home in Colorado. He awoke about 0530 MDT.
- He said he did not recall exactly what he did during the day but did recall doing lawn chores and taking his kids to school.
- He commuted on a flight from Grand Junction, CO to Phoenix, AZ. The flight departed at about 1825 MDT and arrived in Phoenix, AZ at about 1825 MST.

2.1.6 Captain Higman's Toxicology tests:

Post-accident toxicology tests were not performed.

2.2 Second-in-Command (SIC) Steven John Stackelhouse, F/O U S Airways

F/O Stackelhouse was 43 years old.
His date of hire at U S Airways was: October 23, 2000.

2.2.1 F/O Stackelhouse's Pilot Certificates and Ratings Held at Time of the Accident

AIRLINE TRANSPORT PILOT (issued March 21, 2006)
AIRPLANE MULTIENGINE LAND
BE-1900, A-320
COMMERCIAL PRIVILEGES
AIRPLANE SINGLE ENGINE LAND
A-320 CIRC APCH – VMC ONLY
A-320 SIC PRIVILEGES ONLY

FLIGHT INSTRUCTOR (issued June 27, 2007)
AIRPLANE SINGLE AND MULTIENGINE
INSTRUMENT AIRPLANE

[12] MDT is not observed in Arizona except in the Navajo Nation.
[13] Reserve – when a pilot was on-call for possible duty if needed by the airline.

GROUND INSTRUCTOR (issued May 6, 1998)
ADVANCED

MEDICAL CERTIFICATE SECOND CLASS (issued March 27, 2012)
Limitations: Must Wear Corrective Lenses[14]

2.2.2 F/O Stackelhouse's Certification Record

FAA Records of the F/O indicated that:

Private Pilot - Airplane Single Engine Land certificate was originally issued on August 2, 1986.

Commercial Pilot – Airplane Single Engine Land – Instrument Airplane certificate was originally issued on March 13, 1989. Multiengine Rating was added on November 24, 1989.

Airline Transport Pilot – Airplane Multiengine Land BE-1900 rating - Commercial Pilot Privileges – Airplane Single Engine Land; BE-1900 Second In Command Required certificate was originally issued on October 12, 1994. The BE-1900 Second In Command requirement was removed on October 3, 1999. An A-320 rating was added on March 21, 2006 with the following limitations A-320 – Circ Apch – VMC only and A-320 – SIC Privileges Only.

Flight Instructor – Airplane Single Engine certificate was originally issued on June 20, 1989. A Multiengine rating was added on May 2, 1990. A Instrument Airplane rating was added on May 10, 1990.

A Notice of Disapproval was issued on June 6, 1989 when he failed the oral examination for a Flight Instructor certificate. He was retested and issued a certificate on June 20, 1989.

A Notice of Disapproval was issued on October 12, 1994 when he failed ILS approach procedures on the flight test for a Airline Transport Pilot certificate. He was retested and issued a certificate on October 12, 1994.

A review of FAA records found no prior accident, incident or enforcement actions.

2.2.3 F/O Stackelhouse's Training and Proficiency Checks Completed

Originally transitioned to F/O: October 23, 2000.
Originally transitioned to F/O on Airbus A319/A320/A321: July 2, 2002.
Type rated on A319/A320/A321: March 21, 2006.
Last recurrent ground training: July 5, 2011.
Last Proficiency Check in A319/A320/A321: July 6, 2011.
Last SIC Line Check: July 7, 2011.

U S Airways reported that F/O Stackelhouse had no record of failures during company training.

[14] The F/O stated that he was wearing his glasses at the the time of the event.

A review of FAA NPTRS records for F/O Stackelhouse was unremarkable.

2.2.4 F/O Stackelhouse's Flight Times[15]

Total pilot flying time	About 12,850 hours
Total pilot-in-command time	About 1,300 hours
Total A319/A320/A321 flying time –all SIC	About 7,075 hours
Total flying time last 24 hours	About 1 hour
Total flying time last 30 days	About 75 hours
Total flying time last 90 days	About 225 hours

2.2.5 F/O Stackelhouse's Reported Activities

F/O Stackelhouse reported his activities during an interview:

On the day of the accident, Saturday, April 14, 2012.

- He was based in Phoenix, AZ but lived in Denver, CO.
- He awoke in Denver about 0630 MDT and had slept "good".
- He went to his boys' baseball tournament until about 1500 MDT when he returned home.
- He departed his home at about 1630 MDT to catch an 1820 MDT flight from Denver, CO to Phoenix, AZ. He arrived in Phoenix, AZ at about 2000 MST[16].
- He checked in for his flight at about 2045 MST.
- The accident occurred on the first flight of the first day of a planned four day trip.

The day before the accident, Friday, April 13, 2012.

- He had been off duty for four days.
- He awoke about 0700 MST and had slept "good".
- He took his kids to school.
- He had various appointments till about noon.
- He worked "around his house".
- He picked up his kids from school. He took his kids to baseball practice.
- He went to bed about 2300 MST.

Two days before the accident, Thursday, April 12, 2012.

- He awoke about 0700 MST and had slept "good".

[15] Approximate based on U S Airways employment records and interviews.
[16] MDT is not observed in Arizona except in the Navajo Nation.

- He took his kids to school.
- He was at home alone. He worked on his house.

2.2.6 F/O Stackelhouse's Toxicology tests:

Post-accident toxicology tests were not performed.

3.0 Meteorological Information from Air Traffic Control

After a review of all air traffic control voice recordings and radar source data, an NTSB Air Traffic Control (ATC) investigator found no inconsistencies or deficiencies in the ATC services provided. There were no current Pilot Weather Reports (PIREP's) for the accident airplane's route of flight. The most recent PIREP at the time of the accident was more than five hours old, which was outside the timeframe that a PIREP would be considered "current" and issued by ATC. Provided services were within the current FAA and local rules and regulations.

4.0 Company Overview

U S Airways Inc. was a 14 CFR Part 121 operator with headquarters located at 111 W Rio Salado Parkway, Tempe, AZ. U S Airways had about 32,000 employees at the time of the accident which included 4,325 pilot flight crew members. At the time of the accident, U S Airways operated the following aircraft: 15 Embraer E190 airplanes, 228 Airbus A319/ A320/ A321[17] airplanes, 47 Boeing B-737 airplanes, 24 Boeing B-757 airplanes, 10 Boeing B-767 airplanes, and 16 Airbus A330 airplanes.

5.0 Turbulence Plot

During post-accident interviews, the accident crew stated that they reviewed the turbulence plots on the flight release flightplan[18] for the accident flight and also used the plots to brief the flight attendants on the expected ride conditions they could expect during the flight to DEN. The flight plan provided potential turbulenceinformation on several portions on the accident flight plan which were from one navigation fix to the next. Below is a portion of the flight plan that the crew received for the flight to DEN. An example of a turbulence plot that the crew referred to is highlighted in the example. The turbulence plot was an indicator of expected turbulence during that portion of the flight. The accident flight plan had only zeros in each of the turbulence plots which was an indication of no expected turbulence during the flight.

TO MC DST FL OAT IAS ETE ETA BO EFOB LAT
ROUTE MH DTGO TROP WIND G/S E/TM ATA T/BO AFOB LONG
FREQ TRB M DIFF DIFF

PHOENIX SKY HARBOR INTL N3326.0 W11200.6

[17] The A319 and A320 and A321 airplanes were operated under a common type rating issued by the Federal Aviation Administration.
[18] See Attachment 2 – Flight Release Paperwork - page 2

SILOW 007 071 33 M58 018 .... N3432.6
SILOW1 002 0467 28 32035 323 0018 .... W11132.0
0 ....

F. LIST OF ATTACHMENTS

Attachment 1 – Interview Summaries and Written Statements
Attachment 2 – Accident Flight Release paperwork

Submitted by:

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January 2, 2013