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NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

OPERATIONS GROUP CHAIRMAN'S FACTUAL REPORT

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

October 27, 1994

OPERATIONS
GROUP CHAIRMAN'S FACTUAL REPORT OF INVESTIGATION

A. ACCIDENT: DCA-94-MA-076

Location: Aliquippa, Pennsylvania
Date: September 8, 1994
Time: 1904 Eastern Daylight Time[1]
Airplane: Boeing 737-300, N513AU

B. OPERATIONS GROUP

The group met at the accident site on September 9 though 15, 1994. The following group members participated in the investigation:

Chairman: Charles F. Leonard
National Transportation Safety Board
Parsippany, New Jersey

Members: Chris MacWhorter
Aviation Safety Inspector
Federal Aviation Administration
Pittsburgh, Pennsylvania

Captain Joseph Lofaso
Air Safety Coordinator
USAir
Pittsburgh, Pennsylvania

Captain John M. Brookman
Accident Investigator
Airline Pilots Association
Pittsburgh, Pennsylvania

Captain David W. Baughman
Check Pilot
USAir
Pittsburgh, Pennsylvania

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[1]All times are provided in Eastern Daylight Time, based on a 24 hour clock.

C. SUMMARY

On September 8, 1994, at 1904, at Eastern Daylight Time, USAir Flight 427, a Boeing 737-300, N513AU, crashed while maneuvering to land at Pittsburgh International Airport, Pittsburgh, Pennsylvania. The airplane was being operated on an instrument flight rules (IFR) flight plan under provisions of Title 14, Code of Federal Regulation (CFR), Part 121, on a regularly scheduled flight from Chicago-O'Hare International Airport, Chicago, Illinois, to Pittsburgh. The airplane was destroyed by impact forces and fire near Aliquippa, Pennsylvania. All 132 persons on board the airplane were fatally injured.

D. DETAILS OF THE INVESTIGATION

1. HISTORY OF FLIGHT

This was the 3rd day of a 3 day flight sequence for this flightcrew. Peter Germano was the captain, and Charles B. Emmett, III, was the first officer. They reported for the first flight of the sequence in Philadelphia, on September 6th, at 1615. They flew to Indianapolis, back to Philadelphia, and then to Toronto, Canada, (YYZ), where they arrived at 2310 and had a layover of 15 hours 46 minutes. Their duty time for this first day was 7 hours 12 minutes, and they had flown 4 hours 56 minutes.

Their duty period commenced on the second day at YYZ at 1400. They flew to Philadelphia, Cleveland, Charlotte (CLT), and then to Jacksonville (JAX), where they arrived at 2254 and had a layover of 14 hours 21 minutes. They were on duty for 9 hours 21 minutes and had flown 5 hours 16 minutes.

On the third day, they arrived at the airport at 1215 for Flight 1181. The airplane for this flight was the airplane involved in the accident, N513AU. It had spent the night of September 7th in Windsor Locks, Connecticut (BDL), where a maintenance transit check was accomplished.[2] Only routine service was performed at BDL. It departed BDL at 0620 on September 8th, as Flight 2411. The route of flight was BDL to Syracuse (SYR), Rochester (ROC), where the flight number was changed to Flight 95, which continued to CLT and JAX.

First Officer Bruce Peck was assigned to Flight 2411 from BDL to SYR to ROC, and then Flight 95 to CLT. In an interview, he stated, that "nothing out of the ordinary occurred on these flights...no problems with the aircraft."

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[2]See Appendix A for B-737-300/400 Transit Check.

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A flightcrew change occurred in CLT. Captain Jeff Overton and First Officer Randy Jones flew N513AU from CLT to JAX. They were both interviewed, and said that there were no malfunctions with the airplane, such as flight controls. They were re-interviewed, after a passenger reported an "abrupt maneuver," during the approach to JAX. The DFDR for this approach showed a roll of 9 degrees to the left, followed by a bank of 12 degrees to the right. Both pilots stated that there were no unusual rolls or abrupt maneuvers. They suggested that perhaps as they changed to different modes of the autopilot, such as from LNAV to Heading to Manual, a slight roll might have occurred, but they had no recollection of any unusual rolling. They restated that there was normal operation of all systems. They recalled making no maintenance write-ups for the airplane.

Captain Germano and his crew departed JAX at 1310 for CLT, arriving at 1421. Flight 1181 left CLT at 1521, destined for Chicago's O'Hare International Airport (ORD), where it arrived at 1707.

Captain Bill Jackson, a USAIR pilot, flew in the passenger compartment from JAX to CLT, and then, due to a full passenger load, occupied the cockpit jumpseat from CLT to ORD. He said that everything was "normal." The crew interaction was routine. He found both pilots "friendly and in good spirits." Additionally, he stated that the flightcrew did not appear tired or stressed. He said Captain Germano flew the leg from CLT to ORD. He described the conduct of the flightcrew as "professional," and he observed no problems with the airplane.

At ORD, N513AU was assigned to Flight 427 with the same flightcrew. There were no items noted in the aircraft maintenance log for this flight, including the Minimum Equipment List (MEL), Configuration Deviation List (CDL), or any Ground Security Items (GSI).

The airplane arrived at Chicago with 13,080 pounds (lbs) of fuel. It was refueled with an additional 2320 lbs[3], for a total departure fuel load of 15,400 lbs. The scheduled fuel burnoff for the flight to PIT was 6400 lbs, plus 600 lbs taxi fuel, for a planned arrival fuel of 8,400 lbs.

Flight 427 departed the gate at 1802, and was airborne at 1810, from runway 32L, destined for the Pittsburgh International Airport (PIT). The filed flight plan for Flight 427 was: SID, J146...J34...DJB...ACO...CUTTA 1...PIT...flight level 330. Time en route was planned for 55 minutes.

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[3]See Appendix B for record of USAIR ORD fueling slip.

A review of the Air Route Traffic Control (ATC) tapes indicated routine communications between the flightcrew of Flight 427 and the ATC controllers. The only difference in the filed flight plan from the one actually flown was the final cruising altitude of 29,000, instead of 33,000. The reason for this change was conflicting traffic, which prevented Flight 427 from climbing to the higher altitude. This is a common procedure, especially on flights with a short en route time.

The cockpit voice recorder and the ATC tapes identified the first officer as flying the airplane on this leg, and the captain was handling the radio transmissions. Conversation within the cockpit was routine and included an appropriate checklist reading. The in-range check to the company was performed by the flightcrew utilizing the ACARS (Automated Communications Addressing & Reporting System). This occurred at 1900.

The en route and initial arrival into PIT for the flight was uneventful. The airplane was being vectored by PIT Approach Control for a scheduled landing on runway 28R, which the flightcrew acknowledged. Flight 427 was assigned an altitude of 6000 feet. It was following Delta 1083, a B-727, which was 4.2 miles ahead. The captain of Delta 1083 was Ralph Fernandez, who did not recall hearing Flight 427 during the approach. He described the flight conditions as "good weather, with no turbulence or bird activity."

Numerous interviews were conducted with flightcrews of aircraft either arriving at or departing PIT about the time that Flight 427 was on arrival vectors. None of the flightcrews described any unusual weather, including turbulence, or the presence of birds.

The cockpit voice recorder indicated that the flightcrew was utilizing the Auto-Flight System (AFS) during the flight. This is the standard procedure for the B-737-300.

The AFS consists of the Autopilot Flight Director System (AFDS) and the Auto-Throttle (A/T). The Flight Management Computer (FMC) provides engine N1 for the A/T and command airspeeds for the A/T and AFDS. The AFDS and A/T are operated from the AFDS Mode Control Panel (MCP) and the FMC from the Control Display Unit (CDU). The AFDS MCP provides coordinated control of the Autopilot (A/P), Flight Director (F/D), A/T, and altitude alert functions. Normally, the AFDS and A/T are used to maintain airspeeds and/or thrust settings calculated by the FMC.

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The pilot enters the airspeed, altitude and desired heading on the MCP, and the Auto-Flight System controls the airplane, while the pilot monitors. The system can be integrated with navigation checkpoints and routings, for automatic flight following.[4]

At 1900:19, the controller issued instructions for Flight 427 to turn left to 140 degrees and to reduce airspeed to 190 knots. The flightcrew acknowledged this and asked for confirmation of the landing runway. At 1902:22, Flight 427 was issued a turn to 100 degrees and advised of traffic at two o'clock climbing out of 3300 feet to 5000 feet.

This traffic was a Jetstream 31, operating as Blue Ridge 6425. Captain Phillippe Burtoboy and First Officer Gary Utz were the flightcrew of this airplane. They stated that neither of them saw or heard Flight 427. While they were on a 360 degree heading, the ATC Departure Controller issued a traffic advisory for "traffic at 11 o'clock." This advisory was cancelled shortly by the controller. The captain of Blue Ridge 6425 recalled seeing traffic at his 1230 to 1 o'clock position, which he thought was a B-727.

The flightcrew of Flight 427 said they were looking for the Jetstream traffic. At 1903:10, they made a transmission which indicated a problem. At 1903:14, the approach controller instructed Flight 427 to maintain 6000. At 1903:16, the flightcrew called "...emergency," followed by an expletive.

Numerous witnesses observed the airplane in its descent, which was described by most observers as "nearly vertical," just prior to impact.

2. FLIGHTCREW INFORMATION

CAPTAIN

Captain Peter Germano, date of birth, [redacted] 1949, was hired by USAir on February 4, 1981. He began his aviation career in general aviation and obtained a Private Pilot Certificate in August 1969. Subsequently, he graduated from U.S Air Force pilot training in December 1973. He was issued a Commercial Pilot Certificate in June 1974. He was employed as a crewmember by Braniff Airways, where he obtained a Flight Engineer Certificate in July 1976. He held an Airline Transport Pilot Certificate, number [redacted], with an airplane multi-engine land rating, and a type rating in the B-737.

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[4]See Appendix C for details of the Auto-Flight System.

According to FAA and USAir records, he was issued a First Class Airman Medical Certificate, on July 9, 1994, with no restrictions.

His first assignment with USAir was as a flight engineer on the B-727. He upgraded to the BAC-111 in November 1982 as a first officer. In September 1987, Mr. Germano transitioned to the B-737-300 as a first officer. His training, line checks, and proficiency checks in these aircraft were all satisfactory.

He upgraded to captain in the B-737-300 on August 25, 1988. Again, his performance was rated satisfactory in the initial training, line and proficiency checks and line oriented flight training (LOFT).[5]

Interviews were conducted with five USAir check captains, who had provided Captain Germano with training in the last 13 months. There were no negative comments about his performance. On April 29, 1994, a check captain conducted requalification training for Captain Germano, who had been on extended sick leave following back surgery.[6] This check captain stated that the training session "went well with no problems." He said that Captain Germano was prepared for the training, and it went smoothly.

Another check captain flew a 3 day trip with Captain Germano, commencing on May 6, 1994, in order to requalify Captain Germano for line duty following the sick leave absence. This check captain stated that Captain Germano was "meticulous...very professional...he paid attention to detail...ran complete checklists...followed all procedures." He had no negative comments.

Captain Joseph L. Turner, Chief Pilot for USAir at the Philadelphia base, was interviewed on September 12, 1994. He said that he knew Captain Germano, who was based in Philadelphia. Captain Turner stated that his impressions of Captain Germano were all very favorable. He said that as far as he knew, Captain Germano conducted his trips in a professional manner. He knew of no discipline actions against him. He stated that there had been no reported difficulty between Captain Germano and the first officers who flew with him. He was "extremely well liked."

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[5]See Appendix D for Captain Germano's training records.

[6]Captain Germano was on extended sick leave from January 25, 1994 until April 28, 1994, for back surgery.

He stated that Captain Germano had a back operation earlier this year. Captain Turner had the same operation several years earlier, and he had spoken to Captain Germano on a few occasions about the operation. He said that Captain Germano recovered from the operation and returned to work. He stated that Captain Germano did not abuse sick leave.

Three first officers who had flown with Captain Germano within the last 60 days were interviewed. None of them had any negative comments about his performance.

Some of their statements were as follows:

* Captain Germano was very good to fly with...he was very proficient...excellent CRM.

* Captain Germano was very personable...very thorough...not excitable.

* Captain Germano flew by the book...used all checklists...no non-standard maneuvers.

The following is a summary of Captain Germano's certificates, flight time, and training:

ATP #.....	1954135
Ratings.....	ASMEL, B-737
SS#.....	085-42-6549
Last Proficiency Check.....	2/6/94
Last Requalification Check....	4/29/94
Last Line Check.....	5/6/94
Last LOFT.....	7/19/94
Total Flight Time..... (derived from last physical)	12,000 hours
USAir Flight Time.....	9,112 hours
Total Time Capt 737.....	3,269 hours
" " F/O 737.....	795 hours
Time last 90 days.....	112 hours
" " 60 days.....	60 hours
" " 30 days.....	20 hours
" " 24 hours.....	8 hours

A search of FAA records revealed no enforcement actions against this certificate. In addition, a review of Captain Germano's USAir personnel records did not reveal any problems, such as excessive sick leave or discipline actions of any type.

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FIRST OFFICER

First Officer Charles B. Emmett, III, date of birth, [redacted], 1956, was hired by Piedmont Airlines on February 2, 1987. He became a USAir employee in 1989, when Piedmont Airlines merged with USAir. His first flight experience was in general aviation. He was issued a Private Pilot Certificate in May 1973; multi-engine and instrument ratings in December 1980; Commercial Pilot Certificate in January 1981; and Airline Transport Rating, number [redacted], in October 1982. When he started with Piedmont Airlines, Mr. Emmett had accumulated 3,180 hours total flight time.

According to company and FAA records, Mr. Emmett was is sued a First Class Airman Medical Certificate, on July 7, 1994, with no restrictions.

His first assignment with Piedmont Airlines was in the Fokker F-28 as a first officer. His training records, proficiency and line checks in the F-28 all indicated satisfactory performance. He transitioned to first officer on B-737-300, on May 1, 1989. Again, training records, proficiency checks, line checks and LOFT indicated satisfactory performance. No negative comments were noted in these records.[7]

Interviews were conducted with two USAir check captains who had provided training to Mr. Emmett in the last 17 months. One check pilot could not recall the training, but he stated that he only remembered the pilots who performed poorly. The second check pilot, who conducted training for Mr. Emmett on May 12, 1994, stated that he recalled the training session. He said that Mr. Emmett was "well prepared...he was a sharp guy...in both the oral and the simulator check." He had no negative comments about him.

The Chief Pilot for USAir in Philadelphia, Captain Turner, stated that he had known Mr. Emmett, since he was hired as a first officer in the Miami, Florida crew base. He said that Mr. Emmett was a "very dedicated, professional, dependable person." Captain Turner had flown with Mr. Emmett and recalled his performance as "extremely professional." He described Mr. Emmett as a "personal friend," who reminded him of his son. He would often visit with Mr. Emmett before trips. He stated that Mr. Emmett never used sick leave. He described him as friendly and a good pilot.

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[7]See Appendix E for Mr. Emmett's training records.

Captains who had flown with Mr. Emmett within the last 60 days were interviewed. They had no negative comments about his performance. Some of their statements were as follows:

* First Officer Emmett had exceptional piloting skills.

* He was the kind of first officer you'd want to fly with. We had an hydraulic problem on the trip and he did a great job.

* His performance was outstanding...very well qualified.

The following is a summary of Mr. Emmett's certificates, flight time, and training:

ATP#.....	[redacted]
Ratings.....	ASMEL
SS #.....	[redacted]
Last Proficiency Check.....	5/12/94
Last Line Check.....	5/17/94
Total Flight Time.....	9,119 hours
USAir Flight Time.....	4,919 hours
Total Time F/O 737.....	3,644 hours
Time last 90 days.....	195 hours
" " 60 days.....	155 hours
" " 24 hours.....	8 hours

A search of FAA records revealed no enforcement actions against this certificate.

A review of the pilot's USAir and Piedmont personnel records did not reveal evidence of problems, such as excessive sick leave, discipline actions, or letters of reprimand.

3. AIRCRAFT WEIGHT & BALANCE AND DISPATCH PAPERS[8]

There were 8 first class passengers and 119 in coach. The cargo consisted of a total of 10 boxes of magazines, weighing 1939 pounds (lbs), which were loaded in the forward compartment along with 425 lbs of passenger baggage. The rear cargo compartment was loaded with 1275 lbs of passenger baggage.

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[8]See Appendix F for aircraft flight papers and dispatch papers, including cargo load report. Some of the papers are copies of the original papers, which were not recovered.

The following represents the weight and balance calculations for N513AU at the ORD departure station:

Operating weight	73,250 lbs
Passenger weight	22,680
Cargo	3,639
Gross weight without fuel	99,569
Zero fuel weight	106,500
Fuel onboard	15,400
Gross takeoff weight	114,969
Maximum takeoff weight(runway 32L)	118,700
Percent MAC	19
Stabilizer setting	4.9

These calculations were rechecked manually by the Operations Group and verified accurate.

4. AERODROME INFORMATION

Pittsburgh International Airport has four runways. The airport elevation is 1203 feet. Flight 427 was scheduled to land on runway 28R, which is 10,502 feet long. There were no significant NOTAMS for the airport during the time period in which Flight 427 was estimated to arrive.

5. WEATHER INFORMATION

The weather at ORD at the departure time of Flight 427 was: 5500 scattered, 12000 scattered, 25000 scattered, visibility 10 miles, temperature 78 degrees F, dew point 57 degrees F, wind from 230 degrees at 13 knots, and an altimeter of 30.88.

A large area of good weather conditions prevailed throughout the route of flight for Flight 427, from ORD to PIT.

The weather in Pittsburgh at 1852 was: sky clear, visibility 15 miles, temperature 73 degrees F, dew point 51 degrees F, wind from 250 degrees at 7 knots, and an altimeter of 30.10, with a few cumulus clouds.

Interviews with pilots operating in the Pittsburgh area at the time of the accident indicated hazy flight conditions, especially when on a westerly heading. Otherwise, the pilots interviewed all confirmed excellent flight conditions, with no reports of turbulence.

6. COMPANY BACKGROUND

USAir, at the time of the accident, employed approximately 46,000 people. It was operating a fleet of 443 aircraft, as follows:

TYPE	NUMBER	TYPE	NUMBER
767-200	12	737-200	79
757-200	24	MD-80	31
727-200	8	DC-9-31	73
737-400	54	F-100	40
737-300	101	F-28	21

The present airline is the result of several mergers over the past 6 years. The most ambitious mergers occurred in 1988, when USAir acquired Pacific Southwest Airlines (PSA), and in 1989, when USAir merged with Piedmont Airlines. At the time of the merger, PSA was operating 31 MD-80's, 4 DC-9's, and 18 BA-146's. When the merger with Piedmont Airlines occurred, both airlines were about the same size; each employing approximately 3,000 pilots. Since that time, there has been a gradual downsizing of the pilot force, as a result of the sale of older, smaller aircraft, and some requiring three pilots. Approximately 4,986 pilots are currently employed by the company.

The task of standardization of the different pilot groups resulting from the mergers was handled by a concept described as "mirror-imaging." This involved developing a team of check pilots from each airline to establish standardized procedures for the fleet of aircraft. These procedures were basically mirrored after the current ones used by USAir, and then applied to each airplane. The pilots from the different airlines were not integrated to fly in the same airplane for about 8 months after the mergers, and until the first stage of the mirror-image program was completed. Check airman from USAir, PSA and Piedmont were assigned full-time to the team, which was designated to accomplish the mirror-image training. Checklists, Flight Operations Manuals, and Pilot Handbooks were all rewritten to reflect standardized procedures. During recurrent training sessions, simulator training periods and other special meetings, the mirror-image concept was fully implemented.

7. USAir TRAINING DEPARTMENT[9]

DIRECTOR OF FLIGHT TRAINING AND STANDARDS

Flight training at USAir is the responsibility of the Director of Flight Training and Standards, a position presently held by Captain Thomas Johnson. His job summary is as follows:

> Directs the administration of pilot and flight engineer qualification and training, and assures the continuing competency of the pilots, check pilots, and instructors.

He reports directly to the Vice President Flight Operations, currently, Captain Gene Sharp. In the past 6 months, there have been several changes in the management staff, including the Director of Flight Training and Standards. Captain Johnson assumed this position on June 15, 1994.

He was hired by the airline, then called Allegheny Airlines, in January 1978 and has held numerous management and training positions. For instance, in 1989 he was the F-100 Flight Manager, when this new aircraft was placed in the USAir inventory. In 1991, he was assigned to implement the Cockpit Resource Management Program at USAir. In addition, he has worked on the windshear program. In 1994, he became a check pilot in the B-767.

He holds an Airline Transport Pilot Rating and has accumulated about 12,000 flight hours. He currently maintains his check pilot qualification in the B-767.

The Flight Operations Department organization has six Flight Training Managers for the following aircraft:

B-757/B-767/B-727

B-737-300/B737-400

B-737-200

DC-9/MD-80

F-100

F-28

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[9]See Appendix G for organizational charts and description of duties and responsibilities of various positions. [9]

When Captain Johnson assumed the position of Director of Flight Training and Standards, he asked for the resignation of all Flight Managers. He then re-interviewed those Flight Managers, who were interested in remaining in the position. After a period of re-evaluation, three of the previous Flight Managers were retained (F-28; B-757/767/727; B-737-200), and he appointed three new Flight Managers (F-100; DC-9/MD-80; B737-300/400).

Captain Johnson stated that one of his first tasks was to reduce the number of days the check pilots worked in training activities, from the present average of 18 days to 16 days. The check pilots at USAir perform all training and checking functions, including initial simulator training, LOFT, Proficiency Checks, Requalifications, Line Checks, Initial Operating Experience, and Special Airport Qualification Training, such as Mexico City. In addition to their training duties, they fly regular line trips as often as 2 to 3 times per month. He said that check pilots rarely work double training periods.

Captain Johnson said that management training positions are staffed by pilots with backgrounds from PSA, Piedmont and USAir. He felt that the airlines had been merged successfully, primarily because of the mirror-image program.

He stated that when he accepted the position, he promised to remain in it for a period of 5 years. He felt this was important in order to implement new programs and modify existing ones that were needed to improve the USAir training department.

FLIGHT MANAGER B-737-300/400

Captain James Gibbs was appointed to the position of Flight Manager, B-737-300/400, on July 6, 1994. He reports directly to Captain Johnson. His job summary reads:

> Assist in achieving Flying Department objective of providing a corps of proficient line, training, and check pilots. Assist with Department support programs that insure a safe and efficient flying operation.

Captain Gibbs was hired by Piedmont Airlines December 4, 1978. He was upgraded to captain on the B-727 in May 1984, and later that year transitioned to captain on the B-737. He entered the training department at Piedmont Airlines as a check pilot in 1986 and remained there until the merger in 1989. He transitioned to captain in the B-737-300 in 1993, and he has accumulated about 3700 hours in the B-737. Captain Gibbs currently flies the B-737-300/400, and he maintains his check pilot status.

He stated that the B-737-300/400 was the airline's lead aircraft towards implementing the Advanced Qualification Program (AQP).

The B-737-300/400 program is organized with 2 Senior Check Airmen, 6 Check Pilot Designees and 47 full-time check pilots. There are two simulators in CLT and two in PIT. The training load is split approximately in half between the two bases. There are about 1750 USAir pilots flying the B-737-300/400. These pilots fly both the B-737-300 and the 400 models, but they do not fly the B-737-200, which is equipped with different engines and is a separate category for the flightcrews. The B737-300/400 is flown by flight crews at seven crew bases.

Captain Gibbs described the check pilot standardization program as follows:

* Quarterly check airmen meetings[10]

* Check Pilot Letters

* "E" Mail distribution of numerous items of standardization

Standardization matters are regularly addressed through the Standardization Committee, which is comprised of the following individuals:

* Flight Manager

* The two Senior Check Airmen

* The six Check Pilot Designees

* The FAA Aircrew Program Manager (APM)

* A representative of ALPA

This committee meets several times each year (the goal is monthly) to discuss standardization matters, ranging from specific syllabus procedures, training techniques, grading criteria, trend analysis, etc. In addition, Captain Gibbs meets several times each month with the Director of Flight Training and Standards.

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[10]See Appendix H for samples of Quarterly Check Pilot Meetings and Check Pilot Letters.

SENIOR CHECK AIRMAN

Captain Edward Bular is one of two Senior Check Airmen in the B-737-300/400 program. He has held this position since 1990. His job summary is as follows:

> Assist in achieving Flying Department objective of providing a corps of proficient line, training, and check pilots[11]. Assist with Department support programs that insure a safe and efficient flying program.

He reports directly to Captain Gibbs. The other Senior Check Airman has just recently been assigned to this position. Captain Bular was hired by USAir in November 1980, after service in the U.S. Air Force. He flew first as a flight engineer, and then as a first officer in both the DC-9 and the B-727. He upgraded to captain in the B-727 and the B-737 about 1986. In 1989, he became a check pilot in the B-737. He has approximately 10,000 hours of total flight time. This is his full-time position. He maintains both his currency in the B-737-300/400 and his check pilot's status.

Captain Bular and the other Senior Check Airman give the training and proficiency checks to the six Check Airmen Designees. He said that his major task is the selection, training and standardization of the check pilot corps. The six Check Airmen Designees conduct the training and proficiency checks for the check pilots assigned.

Captain Bular said that the check pilot staff in the B-737-300/400 is being increased to 53 as soon as candidates could be trained. The purpose of this was to reduce the number of days that each check pilot worked in training, and allow them to fly line trips more often.

He described the folder that each pilot receives prior to training, in which common errors are described, along with description of expected maneuvers to be accomplished, and areas for oral briefings, etc.[12]

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[11]See Appendix I for USAir Check Pilot Handbook.

[12]See Appendix J for example of Common Error List and PC/PT Guideline.

PROFICIENCY CHECK RESULTS

The pilot Proficiency Check records were examined by investigators. The USAir training department conducted 3666 pilot proficiency checks (PC) during the 12 month period, from September 1993 through August 1994. Of this number, there were 18 checks which were graded "Unsatisfactory" in the records which were presented to the Safety Board. The proficiency check number/unsatisfactory (U) by aircraft type were as follows:

Type Aircraft	Number of PC's	Number U's
B-737-300/400	1280	7
B-737-200	623	1
B-727	146	1
B757/767	392	2
DC-9	510	1
MD-80	230	2
F-100	315	1
F-28	170	3

This represents an unsatisfactory rate for proficiency checks of .0049%.

The Safety Board surveyed six other major air carriers to determine their PC unsatisfactory rate. The following is a summary of that survey as provided by the FAA:

Airline	Unsatisfactory Rate
A	.76%
B	1.80
C	1.80
D	2.17
E	1.11
F	2.10

The results of the USAir rate were discussed with USAir training personnel, the FAA Principal Operations Inspector and one of the B-737-300/400 Aircrew Program Managers. They acknowledged that these results indicated training was being accomplished during the proficiency checks, but they stated that this was appropriate and permitted, as long as the time allocated for the proficiency check was not exceeded. The FAA provided an excerpt from the Inspector's Handbook, FAA Order 8400.10[13], page 6-231, dated 7/28/92, which states:

> Repeating events. FAR 121.441(e) authorizes check airmen to give additional training to an airman who fails to satisfactorily complete an event on a check. The additional training must be given prior to repeating the event. Problems have occurred in instances where check airman have merely repeated events until the airman performed these events within tolerances. This practice is not acceptable and is an abuse of training to proficiency.

Paragraph 261 on the same page describes when training can be performed during a proficiency check. It states:

> Deficiencies. While certain training benefits are gained during proficiency or competency checks, the purpose of a check is to have the airman's state of proficiency evaluated and to ensure that the last training conducted was sufficient to ensure the airman's proficiency throughout the interim period. If the check airman conducting the check observes minor deficiencies (and believes that minor instruction may correct the situation) the check airman may suspend the check temporarily, conduct remedial training, and then resume the check.

From the same Inspector's Handbook, page 3-309, Paragraph 541B, dated 9/30/92. It states:

> Training to proficiency. When a check airman determines that an event is unsatisfactory, the check airman may conduct training and repeat the testing of that event. This provision has been made in the interest of fairness and to avoid undue hardship and expense for airman and operations. Training may not be conducted, however, without recording the failure of these events.

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[13]See Appendix K for excerpts from FAA Inspector's Handbook, 8400.10.

The quality control of a training program is accomplished, among other means, by identifying those events on checks which crewmembers fail...

> (1) Training and checking cannot be conducted simultaneously. When training is required, the check must be temporarily suspended, training conducted, and then the check resumed.
>
> (2) When training to proficiency is required, the check airman must record the events which were initially failed and in which training was given.
>
> (3) When training to proficiency is conducted and the check is subsequently completed within the original session, the overall grade for the check may be recorded as satisfactory....

UNUSUAL ATTITUDE RECOVERY TRAINING

USAir training department personnel were asked about any training conducted in the area of aircraft "unusual attitude recovery." They stated that no such training was in the training syllabus. They do train in the following maneuvers:

* Recovery from approaches to stalls
* Recovery from a "Dutch roll"
* High speed buffet
* Steep turns (45 degree bank)
* Wind shear escape

The Safety Board surveyed the following major air carriers to determine what training they provide: Northwest, Delta, TWA, American and Continental. None of these carriers provide unusual attitude recovery training. Their training syllabus is essentially the same as USAir's in the areas described above.

United Airlines is developing a program called "Advanced Maneuvers Package," which involves simulator demonstrations in various maneuvers, including recovery from unusual attitudes.[14]

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[14]The Operation Group Chairman will submit an Addendum to the factual report after additional evaluation of the United Airlines program.

TRANSFER OF AIRCRAFT CONTROL

The USAir Director of Training was asked about what written guidance was available to the flightcrews in the area of transfer of airplane control within the cockpit. He said that currently there is no such written guidance, but he provided a copy of what is being planned for a forthcoming revision to the Flight Operations Manual.

As of the date of the interview, the following had been selected for such guidance:

> Whenever there is a transfer of control of the aircraft, the pilot assuming control will state **"I have the aircraft."** The relinquishing pilot will ensure the transfer and verbally acknowledge **"You have the aircraft."** This procedure is especially critical during emergency situations.

The Safety Board surveyed the following major air carriers about the same issue: TWA, Northwest, American, Continental, United and Delta. It was noted that four of these carriers have written guidance similar to that planned by USAIR, and two of them have no written guidance.

COCKPIT RESOURCE MANAGEMENT PROGRAM[15]

Captain Eddie D. Mayenschein was the manager of the USAir Cockpit Resource Management Program until recently. He was involved in the development of the program for about 3 years. He acknowledged that the company was somewhat behind the industry in this area, until several years ago. Since that time, the progress has been significant.

The current manager of the CRM Program, Captain John Adams, was appointed to that position in April 1994. He reports directly to the Director of Flight Training and Standards, Captain Johnson.

In addition to CRM, Captain Adams has duties involving implementation of the AQP for USAir. The two areas are closely aligned, so integrating CRM responsibilities with the AQP is considered appropriate.

[15]See Appendix L for detailed description of USAIR CRM Program.

The CRM Program at USAir was designed and developed after a study of the FAA Advisory Circular and consultation with other carriers and programs. Phase I was implemented in December 1991, and consisted of a 1 day, 8.5 hour course for all pilots, presented by two trained CRM Facilitators. These sessions were in pilot groups ranging from 12 to 40 participants. All phases of CRM were addressed, and active role playing was utilized. Other company personnel were included, such as flight attendants, maintenance, dispatch and customer service. All pilots participated in this training. Phase I has been completed, but continues on a quarterly basis for pilots returning to the line from extended absence.

Phase II of the CRM Program was designed around the Line Oriented Flight Program (LOFT), which each captain receives annually and each first officer every 24 months. Each check pilot is trained in the CRM skills by other check pilots (identified as CRM Facilitators), who have received special training in this area. The check pilots are trained both in the classroom and in the simulator by the CRM Facilitators.

Each USAir simulator is equipped with a high resolution video camera. The entire simulator training session is filmed, including all conversations between the flightcrew. The check pilot sits behind the flightcrew in the usual position. During the LOFT, the check pilot can mark the video to identify specific events that occur. After the LOFT is completed, the flightcrew and the check pilot return to the briefing room and view the video of the LOFT. The check pilot can fast forward to areas of the LOFT which were marked for special review and discussion. When the LOFT has been reviewed and critiqued by the check pilot and the flightcrew, the video is erased.

A LOFT Committee meets once a month to discuss LOFT activities, including the development of new LOFT scenarios.[16] This committee is composed of the following personnel:

* Flight Manager (or his representative)

* FAA APM

* CRM Manager

* Simulator engineer

* A check pilot from each type of airplane

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[16]See Appendix M for the 1994 LOFT.

At each pilot recurrent training class, a 1 hour block of time is devoted to current CRM matters. This has recently involved attendance at recurrent sessions by a flight attendant facilitator.

8. FLIGHT SAFETY

USAir has a full-time flight safety department, identified as Quality Assurance/Flight Safety. The Director, Captain George Snyder, reports directly to the Vice President Flight Operations, Captain Gene Sharp.

Captain Snyder was hired by USAir in 1980, with a corporate and commuter airline background. He flew the BAC-111, DC-9 and B-727 as a first officer, and upgraded to captain in the BAC-111 and DC-9 in 1986. He became a check pilot in the DC-9 and then the MD-80. He is current in both the DC-9 and the MD-80, and maintains his check pilot status.

Captain Snyder was assigned as a check pilot in the "mirror-image" program, which involved the merger of PSA. He was responsible for the MD-80 and the DC-9 aircraft in this program.

He has been trained in accident investigation through courses at the University of Southern California, the NTSB and several ALPA Investigation Training Sessions. He has been involved in accident investigation activities since 1979.

Captain Snyder assumed this position on March 3, 1994. He has a staff of two full-time check pilots. He explained that shortly after taking this position, he and his staff travelled to each pilot crew domicile and met with groups of 15 to 20 pilots for an open discussion of any problems. It took 6 weeks of travel to complete this program, but he assessed it as "highly productive." Through this method, they learned about difficulties that needed to be addressed. They formed a "partnership" with the FAA, ALPA and the USAir management, which he described as "proactive," in order to remedy any problems.

He is in the process of choosing check pilots from each model airplane in the USAir fleet, to be assigned as incident/accident representatives for that airplane. These check pilots will be trained at USC and other accident investigation schools. They will be the "point person" for that airplane and investigate all incidents.

Captain Snyder described the method in which safety information is disseminated to the pilots. Important items are issued to the pilots directly via "E" mail, bulletin boards, attachments to flight papers, and printed safety notices distributed to each pilot's mailbox by the chief pilot's staff.

Another primary method of communication with the line pilots is through the training department; specifically by transmitting safety information to the check pilots for dissemination during simulator training sessions and line checks. In addition, the publication, Flight Crew View, addresses safety related items at each publication.[17] He also said that plans are underway for his own department to issue a monthly flight safety publication.

9. AIRLINE PILOTS ASSOCIATION

During the many interviews that were conducted in this investigation, with both USAir management personnel and FAA officials, there were frequent references to the active, positive participation of the USAir Airline Pilots Association staff in every area of training and safety. These comments were unsolicited and were without exception complimentary. It was evident that there is strong cooperation among the participants in both safety and training: USAir Management, FAA, and ALPA.

The USAir ALPA Master Executive Council publishes a monthly magazine, US AIRWAVES.[18] Numerous safety and training matters are discussed in each issue. Each pilot receives a copy of this publication.

The USAir ALPA Professional Standards Committee was reported by company management to be "strong and cooperative" in dealing with problems. One chief pilot stated that he almost always approached the local ALPA representative before confronting a pilot about an issue. He stated that the matter was usually resolved without additional effort by him. Some of these were safety related items, such as non-standard procedures.

10. FAA OVERSIGHT AND SURVEILLANCE[19]

PRINCIPAL OPERATIONS INSPECTOR

The Principal Operations Inspector (POI) is currently David L Bowden. He was hired by the FAA in May 1987. His previous flying experience included U.S. Air Force flight training and subsequent flight time in the military version of the B-707. In addition, he had corporate experience in the Learjet and Fokker aircraft. He has a total flight time of about

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[17]See Appendix N for a copy of Flight Crew View.

[18]See Appendix O for issue of US AIRWAVES.

[19]See Appendix P for excerpts from the FAA National Aviation Inspection Program Inspection Report, dated March 19, 1993.

4,000 hours. He holds an Airline Transport Pilot Certificate, with type ratings in the B-707/720, DC-9, and the Learjet.

Mr. Bowden was assigned directly to the Pittsburgh FAA Flight Standards District Office. He was appointed to the position of Assistant POI for USAir, shortly after initial training with the FAA. He assumed his present duties in December 1990.

The POI has a full-time staff of 11 Aviation Safety Inspectors (ASI). Eight are Aircrew Program Managers (APM) for the different aircraft operated by USAIR, and three are assistants.

The total Certificate Management Unit (CMU) for USAir has a ratio of one ASI per seventeen aircraft. This compares with the following CMU staffing ratios for other major air carriers:

Airline	Staffing	Number Aircraft	Ratio
Northwest	26	360	14
American	31	685	22
United	26	552	21
Delta	26	673	26
Continental	20	303	15

Mr. Bowden conducts monthly meetings with his staff to discuss trends, problems, and status of surveillance issues. He is in regular contact with the USAir Director of Training regarding approval of changes to flight manuals, training syllabi, and discussion of any problem areas.

He has initiated a "spirit of partnership" with USAir and ALPA. An example that he provided was the Altitude Awareness Program, in which USAir and ALPA teamed cooperatively with the FAA to develop a meaningful program to eliminate, or at least significantly reduce, the incidents of altitude deviations by USAir flightcrews. The program was highly successful as measured by the dramatic reduction of such events.

He stated that the APM's are actively involved with the training program for each airplane. They attend check pilot standardization meetings and LOFT Committee Meetings.

Mr. Bowden described the efforts of his staff as "proactive," as opposed to "reactive." He had highly complimentary comments for the current USAir training department. He stated that the

recent changes should have a positive impact. He also praised the CRM Program, describing it as "excellent." Additionally, he referred to the noteworthy contributions made by the USAir Airline Pilots Association in the area of safety and training.

AIRCREW PROGRAM MANAGERS

Mr. Matthew J. Schack is one of two FAA Aircrew Program Managers (APM) assigned to the B-737-300/400. He basically handles the training conducted in Pittsburgh. He has been employed by the FAA for about 6 years, all of which have been in the Pittsburgh FSDO. Prior to this he was an Air Technician for the Air Force Reserve. He holds an Airline Transport Pilot Certificate, with a rating in the B-737 and the F-100. He was appointed to his present position in November 1992.

Mr. Schack described the relationship between USAir and the FAA as "good." He attends all check airman meetings and standardization committee meetings. He stated that he meets each month with the Flight Manager, the two Senior Check Airmen and the six Check Pilot Designees for open discussion of issues and standardization. In addition, he stated that he observes simulator training about twice per week. He also conducts enroute checks, with his last one in July, from PIT to LGA. He approves all changes in the training syllabus, but it is usually discussed prior to being submitted, so there are no surprises.

Mr. Schack described the CRM Program at USAir as "very good ...a model one."

Mr. Donald E. Franklin is the other APM for the B-737-300/400. He has been employed by the FAA since September 1974 and has held a variety of positions, including POI for other air carriers. He was trained in the U.S. Army, and holds an Airline Transport Pilot Certificate, with ratings in nine aircraft, including the B-737.

He handles the Charlotte training facility for the FAA. He monitors the simulator checks given by each Check Pilot Designee two times per year. He also observes the simulator checks conducted for the Senior Check Airman. He always attends the check pilot standardization meetings. In addition, he conducts enroute checks each month.

11. MILITARY CONTRACTS

USAir is a military contract carrier. The Department of Defense completed a Capability Survey of USAir in June 1994.[20] The airline was rated "Excellent" to "Above Average" in all areas of flightcrew operations, training, and safety.

[redacted]
Charles F. Leonard
Chairman, Operations Group

[20]See Appendix Q for excerpts from DOD Capability Survey Report.