

Docket No. **SA-509**

Exhibit No. **3A**

NATIONAL TRANSPORTATION SAFETY BOARD

WASHINGTON, D.C.

AIR TRAFFIC CONTROL GROUP CHAIRMAN'S FACTUAL REPORT

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

August 29, 1994

AIR TRAFFIC CONTROL GROUP CHAIRMAN'S FACTUAL REPORT

A. ACCIDENT

Aircraft: USAir flight 1016, McDonnell Douglas DC-9-31, N954VJ
Location: Charlotte/Douglas International Airport, Charlotte, North Carolina
Date: July 2, 1994
Time: 1842:25 Eastern Daylight Time (EST) (2242:25 UTC¹)
NTSB No: DCA-94-MA-065

B. AIR TRAFFIC CONTROL GROUP

Chairman: Sandra L. Simpson
National Transportation Safety Board
Washington, D.C.

Member: David Bernier, USAir
Pittsburgh, PA

Member: William West, NATCA
Philadelphia, PA

Member: A.C. Everett, USAir Dispatch
Pittsburgh, PA

Member: John Cox, ALPA
St. Petersburg, FL

C. SUMMARY

On July 2, 1994, about 1843 eastern daylight time (EDT), a Douglas DC-9-31, N954VJ, owned by USAir, Inc., and operated as USAir flight 1016, collided with trees and a private residence while executing a missed-approach following an instrument landing system (ILS) approach to runway 18R at the Charlotte/Douglas International Airport in Charlotte, North Carolina. The captain and one flight attendant received minor injuries; the first officer, two

¹All times will be expressed in local time based on the 24-hour clock with the exception of "History of Flight" which is expressed in Universal Coordinated Time (UTC) or unless otherwise noted.

flight attendants and 18 passengers sustained serious injuries; and 37 passengers received fatal injuries. The airplane was destroyed by impact forces and a post-accident fire. Instrument meteorological conditions prevailed, and an instrument flight rules (IFR) flight plan had been filed. Flight 1016 was being conducted under 14 Code of Federal Regulations (CFR), Part 121, as a domestic, scheduled passenger service flight from Columbia, South Carolina to Charlotte.

D. DETAILS OF THE INVESTIGATION

1. History of Flight

At 2227:06, the flight crew of USAir flight 1016 (USA1016) made initial contact with the Charlotte Terminal Radar Approach Control (TRACON) Arrival Radar West (ARW) controller and advised that the flight was at 12,000 feet msl² with the current Automatic Terminal Information Service (ATIS) broadcast, "yankee." The controller replied, "USAir ten sixteen...expect runway one eight right." The flight crew acknowledged. At 2228:12, the ARW controller instructed the flight crew to descend to 10,000 feet. The flight crew acknowledged. At 2230:09, the flight crew said, "We're gonna swing just uh a five uh degrees to the right here just for about uh a quarter half mile." The ARW controller approved this request. At 2233:15, the flight crew said, "We're showing uh little build-up here it uh looks like it's sitting on the radial, we'd like to go about five degrees to the left to the...." The ARW controller replied, "How far ahead are you looking [USAir] ten sixteen?" The flight crew said, "About fifteen miles." The ARW controller replied, "I'm going to turn you before you get there I'm going to turn you at about five miles northbound." The flight crew said, "okay." At 2233:57, the controller turned the aircraft to a heading of three six zero which the flight crew acknowledged. At 2234:57, the flight crew was instructed to descend to 6,000 feet. At 2235:04, the flight crew was instructed to contact the Final Radar West (FRW) controller. The flight crew acknowledged.

At 2235:18, the FRW controller said, "USAir ten sixteen...maintain four thousand runway one eight right." The flight crew acknowledged. Approximately thirty seconds later the controller said, "USAir ten sixteen turn ten degrees right descend and maintain two thousand three hundred vectors visual approach runway one eight right." The flight crew acknowledged. At 2236:55, the FRW controller said, "Tell you what USAir ten sixteen they got some rain just south of the field might be a little bit coming off north just expect the I-L-S now maintain amend your altitude maintain three thousand." The flight crew acknowledged. At 2237:33, the Charlotte Tower Local East Controller (LCE³) transmitted to the flight crew landing runway 23, "Piedmont thirty two eleven (a DH-8) heavy heavy rain on the airport now wind one five zero at one four." At 2237:40, the FRW controller instructed the flight crew to "turn right heading zero niner zero." This was acknowledged by the flight crew of USAir 1016. At 2238:24, the

²All altitudes will be in msl, mean sea level, unless otherwise noted.

³The Local control East position was responsible for aircraft arriving and departing runway 5/23 and 18L/36R. Runway 18L is located 5,000 feet east of runway 18R.

controller said, "USAir ten sixteen turn right heading one seven zero four from SOPHE [the outer marker for runway 18R ILS]...cross SOPHE at or above three thousand cleared ILS one eight right approach." The flight crew acknowledged. At 2239:22, the FRW instructed the flight crew to contact the tower which the flight crew acknowledged.

Meanwhile, the Charlotte Tower Local West Controller (LCW) had a conversation with the flight crew of USAir 806, a departure flight. At 2239:12, the flight crew of USAir flight 806 said, "And eight oh six looks like uh we've gotten a storm right on top of the field here." The LCW controller said, "affirmative." The flight crew of USAir flight 806 elected to delay the departure.

At 2239:38, the flight crew of USAir flight 1016 made initial contact with the local controller. The LCW controller said, "USAir ten sixteen Charlotte Tower runway one eight right cleared to land following a F-K one hundred short final previous arrival (USAir 677, an FK28) reported smooth ride all the way down the final." The flight crew responded, "USAir ten sixteen I appreciate a PIREP [pilot report] from that guy in front of us." ("That guy in front of us" was USAir flight 984, an FK-100 that circled from runway 23 to runway 18R.) After receiving the flight conditions, the LCW controller reported a "smooth" to the flight crew. The flight crew requested wind information. At 2240:37, the LCE controller advised USAir 52, a Boeing 737 departing runway 18L, "...aircraft just departed ahead of you said smooth ride on departure wind is one zero zero at one niner gusting two one." USAir flight 52 was then issued a takeoff clearance. At 2240:50, the LCW controller said, "USAir ten sixteen the winds is showing one zero zero at one nine." The flight crew acknowledged. At 2240:56, the controller said, "USAir ten sixteen wind now one one zero at two one." The flight crew acknowledged. At 2241:05, the LCW controller transmitted "in the blind," "Wind shear alert northeast boundary wind one nine zero at one three." At 2241:08, the LCE controller said, "Attention all aircraft wind shear alert the surface wind one zero zero at two zero northeast boundary wind one niner zero at one six." At 2241:17, the LCW controller issued a landing clearance to Carolina 5211, the aircraft following USAir 1016. The wind was issued in the landing clearance, "...wind one zero zero at two zero wind shear alert northeast boundary wind one niner zero at one seven."

At 2242:07, the LCE controller requested a pilot report from USAir flight 52. The flight crew responded, "Clear after south end of field heavy rain on the roll." The controller responded, "Heavy rain on the roll past mid-field pretty smooth you say." The flight crew corrected him and said, "Well not through the whole roll pretty heavy rain and then on climb out no real bumps but after about a thousand feet or so you're in the clear." At 2242:13, the flight crew of USAir 1016 said, "USAir ten sixteen is on the go." The LCW controller replied, "USAir ten sixteen understand you on the go sir fly runway heading climb and maintain three thousand." At 2242:22, the flight crew responded, "Up to three thousand we're taking a right turn here." There were no further communications with the flight crew of USAir flight 1016.

At 2242:32, the LCE controller advised USAir flight 8926 that was departing runway 18L, "...the D-C nine just departed ahead of you reported heavy rain on the roll through out the

entire roll smooth on the climb out gets out of a thousand feet and says you're in the clear." The flight crew responds, "okay we're ready USAir eighty nine twenty six be advised you're breaking up." The LCE controller responds, "...roger it might be lightning runway one eight left cleared for takeoff surface wind one one zero at one niner wind shear alert northeast boundary wind one eight zero at one five northwest at one seven zero at three four." At 2244:24 the flight crew of USAir 8926 gave the LCE a pilot report. The flight crew said, "USAir eighty nine twenty six be advised moderate rain and it's clear all very smooth."

2. Weather Information

The flight crew of USAir 1016 received arrival information "yankee" which was as follows:

Charlotte International Airport arrival information yankee
Charlotte two one five one zulu weather five thousand scattered
visibility six miles haze temperature eight eight dewpoint six seven
wind one five zero at eight altimeter three zero zero one I-L-S
approaches runways one eight left one eight right localizer back
course runway two three approach in use if unable to comply with
speed restrictions advise read back all hold short instructions
advise you have information yankee.

The flight crew of USAir 1016 did not receive arrival information "zulu" which was current at 1836. The information was as follows:

Charlotte International Airport arrival information zulu Charlotte
two two three six zulu special weather observation measured four
thousand five hundred broken visibility six thunderstorm light rain
shower haze temperature eight eight dewpoint six seven wind one
one zero at one six altimeter three zero zero one I-L-S approaches
runway 18 left, one eight right localizer back course runway 23
approach in use if unable to comply with speed restrictions advise
read back all hold short instructions advise controller information
zulu.

At 1840, the National Weather Service (NWS) sent a special weather observation to the tower facility. After the accident, it was determined that there is a 3 minute time difference between the clock used at the NWS and the tower clock. Therefore, the time the information was sent was actually 1843. The accident occurred at approximately 1842. The TRACON did not broadcast an arrival ATIS containing this information. The 1840 information was as follows:

Charlotte Special weather 2240 UTC: measured ceiling 4,500 feet
overcast, visibility 1 mile with thunderstorm and heavy
rainshowers. Wind 220 degrees at 11 knots. Altimeter 30.03.

Runway 36L RVR more than 6,000 feet. Remarks: thunderstorm overhead, occasional lightning cloud to ground.

3. Low Level Windshear Alert System (LLWAS)

The Charlotte/Douglas International Airport was equipped with an Phase II Low Level Wind Shear Alert System (LLWAS). FAA Order 6560.15 which was used to train controllers, provides a complete description of the 6-station Low Level Windshear Alert System (LLWAS) manufactured by Fairchild Weston Systems Inc. It states in part, "The LLWAS System is designed to scan the airport runway vicinity for certain weather conditions that may be unfavorable for airplane takeoff/landing activities, and then to warn ATC's via alarm whenever an unfavorable condition exists. Weather conditions that LLWAS detects include the following:

° **Windshear** - the point of occurrence of a wind velocity change. While most windshear occurrences are incidental, a windshear that results in a significant increase in tailwind can pose a threat to aircraft near the ground (during takeoffs and landings) at the point of windshear. Usually, a windshear is an instantaneous occurrence....

° **Microburst** - the occurrence of a column of air perpendicular to the ground and with acceleration towards the ground. This occurs when a mass of cooler and/or moister air is moving over a mass of warmer and/or drier air in an opposite direction. At a weak point in the lower air mass, gravity pulls the higher, heavier air through to the ground, creating the column.

Gravitational acceleration can cause the microburst to reach velocities in the 10 to 30 knot range on its downward path. When the microburst column impacts with the ground surface, the air is dispersed in all directions parallel to the earth at even greater velocities because of the pressure exerted by the ground. This poses the greatest threat to aircraft near the ground (during takeoffs and landings) whose path cuts through the microburst area. An airplane going through a 60 knot headwind can suddenly face an abrupt change to a 60 knot tailwind. Microbursts can range from 300 yards to 3 miles in width, and can last in the order of 15 minutes....

The LLWAS includes six Remote Stations, each located at a strategic position around the airport's runway structure. (The Charlotte/Douglas Airport LLWAS consists of 6 sensors: the center field indicator, identified as the "centerfield" or sensor 1, is located to the east of runway 18R/36L at a height of 15 feet above ground level (agl); sensor 2 is located northeast of the airport, for aircraft approaching either runway 18L or runway 23, at a height of 56 feet agl; sensor 3 is located south of the airport, for aircraft approaching runway 36R, at a height of 67 feet agl; sensor 4 is located south of the airport, for aircraft approaching runway 36L, at a height of 57 feet agl; sensor 5 is located southwest of the airport, for aircraft approaching runway 5, at a height of 57 feet; sensor 6, at height of 61 feet agl, is located approximately one-

half mile from the runway 18R threshold.) Each Remote Station collects wind speed and direction data at its location and transmits the data back to the Master Station. One remote station is designated as the Center Field (CF) Station. The CF station, usually the most centrally located, is integral in data calculations, and is usually used as a comparative reference from the data derived from the other Remote Station. Besides collecting wind speed and wind direction data, the CF station also provides gust data....

Each Tower Display provides readings from the centerfield and five other Remote Stations. (At the Charlotte Airport, only four additional sensors are displayed. The centerfield sensor is displayed twice and sensor 5 is not displayed unless it is replacing a failed station. The centerfield average is displayed on the top line and line 2 displays the instantaneous reading. Line 3 displays the information from sensor 2; Line 4 displays information from sensor 3; Line 5 displays information from sensor 4; Line 6 displays information from sensor 6.) The CF line provides the same information as on the TRACON displays. Each of the other lines identifies a Remote Stations current wind speed and wind direction reading. If a windshear and/or microburst condition is calculated for a Remote Station, its corresponding line on the Tower Display flashes and an audible alarm sounds."

The night of the accident, sensor 1, located center field, was the first to activate. It activated beginning at 1840:37 with an indication of 100 degrees at 21 knots. At 1841:07, in addition to the center field sensor activation sensors 2 (northeast) and 3 (south) activated indicating wind 190 degrees at 13 knots and 100 degrees at 08 knots respectively. At 1842:57, in addition to the other sensors, sensor 6 (runway 18R threshold) activated and indicated that the wind was 180 degrees at 35 knots. At 1843:07, all sensors were indicating a wind shear alert until 1844:27. Wind shears were no longer detected on any indicator at 1851:57. Refer to the Weather Group Chairman's Factual Report for the complete LLWAS data.

4. Airport Information

The field elevation of the Charlotte/Douglas International Airport is 749 feet. The touchdown zone elevation for runway 18R is 743 feet. The airport has one set of parallel runways, oriented north/south which are separated by 5,000 feet and one runway, 5/23, that intersects runway 18L/36R. Runway 18R, on which USAir 1016 was to land, is 10,000 feet long and 150 feet wide.

The Charlotte/Douglas Tower/TRACON Air Traffic Control facility is a Level V facility which serves the surrounding metropolitan area 24 hours per day. The facility utilizes an airport surveillance radar (ASR-9) which is augmented with Automated Radar Tracking System (ARTS) IIIA computer tracking. Aircraft generate primary or secondary (beacon) targets which are displayed on the PVD (plan view display) by computer generated symbols and alphanumeric characters depicting aircraft location, identification, ground speed, and flight plan data.

The control tower has 8 positions of operation which may be combined to meet daily and hourly traffic demands. The tower cab is equipped with the following equipment: ATIS, 2 D-BRITEs which display Digital-Bright Radar Indicator Tower Equipment (D-BRITE) system information, 2 Low Level Wind Shear Alert System (LLWAS) indicators, System Atlanta Information Data (SAID) monitors, Integrated Communications Switching System (ICSS), Instrument Landing System, field lighting panels, digital altimeter displays, digital clock displays, runway visual range (RVR) indicators, and various telephone and status displays.

5. Charlotte/Douglas International Airport Equipment Recertification

As a result of the accident, the Airport Surveillance Radar (ASR) (including the weather channel) / air traffic control radar beacon system (ATCRB), Multi-Channel Recorder (MCR) / Digital altimeter setting indicator (DASI) / ATIS, ARTS, LLWAS, RVR (touchdown, mid-field, roll-out), glideslope, localizer, medium approach light system with runway alignment indicator lights (MALSR), middle and outer markers were recertified on July 3, 1994. All of the equipment was determined to be within established standards and tolerances and certified.

6. Airport Surveillance Radar-9 (ASR-9)

The Airport Surveillance Radar-9 (ASR-9) radar system at the Charlotte/Douglas International Airport was manufactured by the Westinghouse Electric Corporation and commissioned on May 21, 1991. This radar was one of 134 ASR-9 radar systems to be dispersed throughout the country. As of August 10, 1994, 85 are in use. The "ASR-9 Weather Channel Test Report" prepared by the Lincoln Laboratory for the Federal Aviation Administration dated May 3, 1989 states in part, "The ASR-9 is a next generation Airport Surveillance Radar...In contrast to earlier FAA radars, the ASR-9 will provide air traffic controllers with quantitative precipitation reflectivity information without the biases introduced by moving target indicator (MTI) circuits or circular polarization. It features robust ground clutter suppression algorithms, spatial and temporal smoothing of the weather maps and range dependent compensation for reflectivity biases introduced by the broad, cosecant-squared elevation antenna pattern of ASRs....The ASR-9 weather channel is designed to provide ATC personnel with an accurate, quantized, clutter-free representation of the precipitation field. Its weather products are generated by either a two-level or six-level weather processor. The ASR-9 weather channel allows ATC personnel to select and display any two of the six NWS levels. The ASR-9 is reliable to within one level as reported by the NWS. The levels are defined in terms of reflectivity. For example Level 1 indicates "light" precipitation; Level 2 indicates "moderate precipitation; Level 3 indicates "heavy" precipitation; Level 4 indicates "very heavy" precipitation; Level 5 indicates "intense" precipitation; Level 6 indicates "extreme" precipitation such as hail.

The ASR-9 antenna rotates at 12.5 rotations per minute and utilizes range-azimuth selectable dual receiving beams ("high" and "low")....The wide elevation beam width and rapid scan rate are dictated by the ASR-9's primary function of detecting and resolving rapidly moving aircraft at altitudes up to 35,000 feet, over a 60 nautical mile radius."

The Maintenance of the Airport Surveillance Radar-9, FAA Order 6310.19, dated July 24, 1991, states in part, "The ASR-9 incorporates a dedicated receiver to detect weather returns during heavy weather conditions....The data is then applied to the six-level weather detector where the weather is classified into six levels of reflective intensity. The weather channel utilizes the NWS standard reflectivity levels for the determination of the six levels of weather. The weather processor does not possess processing for determining the exact nature of the meteorological phenomena producing these weather levels. Consequently, any anomalous propagation which produces these same reflectivity levels will be categorized and displayed as weather. To obtain an accurate assessment of its nature the displayed weather should be confirmed with the NWS."

According to Brian Higgins of the FAA National Data Communications Systems Engineering Division, "Terminal radar antennas are typically designed to provide a uniform high gain fan beam pattern in a shape that approximates a wedge of a pie turned on its side. There is a loss of radar coverage known as the 'cone of silence' over the radar antenna. The cone increases with altitude. Radars do not begin to 'listen' for returns right away. For about 1/8 to 3/16 of a mile in radius around the radar site returns are not processed. Hence there is a narrow cylinder, extending vertically above the radar site, which won't process anything. The fan beam pattern does not extend to the full 90 degrees overhead because it would cause an inefficient gain factor to be built into the antenna and the objects overhead would create a 'ring around' video condition at ranges near the site. Radar systems are placed, in the environment at a location selected to look at objects that are required to be detected. The radar site selection is based on the knowledge of the antenna's detection envelope, what needs to be seen, and in what directions. Needing to look directly overhead would indicate a poor site selection and is totally illogical to have such a requirement for one radar site. The FAA's secondary beacon radar systems provide that information for targets equipped with transponders. It should be noted that these pencil beam systems also do not look directly overhead. It is an illogical need."

According to Mel Stone of Lincoln Laboratories, although a storm may be directly over a radar antenna, a level 5 or 6 would overcome the weather filters within the system and be displayed.

7. Crash Phone Activation

There is no record of the exact time the crash phone was activated alerting the airport fire station, call sign "BLAZE," of the accident. However, the initial communications between BLAZE and the GCE controller began at 1845:15. At 1845:37, BLAZE said, "We have a little problem with our PA system when that alarm came in can you come back with the information all we have is that you lost an aircraft and west of the airport." The ground controller instructed the vehicle, "BLAZE 5 if you will just proceed across runway 18L proceed southwest-bound on taxiway 'A' and uh proceed out toward the approach end of runway 5 I'll have further information for you." At 1846:09, the GCE controller said, "BLAZE 5, we have a large area of smoke visible from the tower now it appears to be approximately a quarter mile north of the old hangar that C-C-Air is using uh for their hangar maintenance it appears that you probably

have to exit the airport property come around to the north side of the airport go by the fuel tanks and down Highway 160 it looks like its in the vicinity of Highway 160." At 1848:12, the GCE controller said, "BLAZE 5 and equipment there is a total of five zero five zero souls plus five crew total fifty five." The BLAZE 5 vehicle replied, "Blaze five five souls." The GCE controller said, "Fifty five zero passengers five crew members total five five souls on board five five." At 1849:47, the GCE controller said, "BLAZE 5 do you need any assistance as far as coordination with Medic or have you already taken care of that." There was no reply to the question.

At 1907:48, the driver of the BLAZE vehicle said, "BLAZE confirmation of souls on board please." At 1908:01, the GCE controller said, "...there's fifty passengers plus five crew." There was no response from the driver.

8. Charlotte Tower/TRACON Controller Interviews

Jeffrey Undrea Vincent

Charlotte Tower Local West Controller

Entered on duty FAA:	September 14, 1986
Entered on duty CLT:	January 12, 1992
Tower Visibility Certification:	November 5, 1988
CTO Certificate Number [REDACTED]	January 9, 1989
Facility Rating CLT:	July 26, 1993
LLWAS Certified at CLT:	July 7, 1992
Most recent tape talk:	March 9, 1994

Mr. Vincent was interviewed by the ATC Group on July 4, 1994. In response to questions, he provided the following information:

His date of birth is [REDACTED]. He attended the pre-developmental portion of the FAA Academy in Oklahoma City, Oklahoma in 1987. This course is designed for the person who has little or no knowledge of the air traffic control system. He served in the US Army for 2 years and 10 months as a radar air traffic controller. He is not a pilot. His operating initials are VT. His most recent medical certification was in September 1993 with approval to take Clariton for allergies. His immediate supervisor since April 1994 was Jeffrey Forman. He did not work any overtime in the last month prior to the accident. He was a full performance level controller (FPL). The day of the accident, his assigned shift was 1345-2145 local time and it was the second day of a five day work-week. The previous shift was 1540-2340 local time. He stated that he was in "excellent" health. He was wearing a headset, monitoring the local west control (LCW) frequency, 126.4; there were no frequencies on speaker. The LCW is responsible for operations on runway 18R.

Additionally, he stated that:

- He received a complete relief briefing from the previous controller. Some information, such as the runway configuration (south flow) and hourly weather, are displayed on the System Atlantic Information Display (SAID).
- He became aware of USAir flight 1016 (USA1016) when the flight crew advised they were inbound for runway 18R. He could not recall the position of the aircraft on final approach. He issued a landing clearance and a pilot report (PIREP) of a "smooth ride" that he received from the flight crew of USA677, an FK28.
- Without reference to any materials, he gave the sequence of events regarding USAir flight 1016 as he remembered them:

The pilot of USA1016 "checked in." He cleared the flight to land on runway 18R and he issued a PIREP. USAir flight 983 (USA983) an FK-100, initially inbound to runway 23, changed to runway 18R and was issued a landing clearance. The flight crew of USA1016 asked for a "ride report" from USA983. He then solicited and issued the PIREP to the flight crew. The report was a "smooth ride." He received a wind shear alert which was issued to the flight crew of USA1016. Carolina flight 5211 made initial contact with the local controller. Another wind shear alert was received and he issued the information with the landing clearance. "Someone" asked for wind information which he issued. The flight crew of USA1016 stated they were "going around." He issued the missed approach instruction "fly runway heading, maintain 3,000 [feet msl]." The flight crew advised they were turning right. He asked the flight crew, "Understand turning right?" There was no response. He called the flight crew several times although there was no acknowledgement from the pilot. He advised the tower supervisor that there was no response from the pilot and asked the LCE controller if USA1016 was on frequency.

- He never saw USA1016 visually, although he did see him on the Digital- Bright Radar Indicator Tower Equipment (D-BRITE.) He could not recall the exact mileage of the radar target from the airport.
- There appeared to be a weather cell in the area. He stated that it was located between runways 23 and 18L (northeast of the airport) and over the airport. He could not distinguish the "level" of the cell because it was directly over the main bang (over the radar antenna); however, it was located to the left of runway 18R and there was rain on the airport. He derived the cell position from the D-BRITE. The shower moved west. It was raining on the airport then it intensified "to a downpour."

- Prior to the accident, he saw a weather cell on the D-BRITE southeast of the field, a single shade. There was a cell 6-7 miles southwest of the field (dark green/light green).
- The range on the BRITE radar display was set for 20 miles, with 5 mile range marks. He could not recall the altitude filter limit.
- Although he could not recall exactly when the intensity of the rain increased, he stated that it was while USA1016 was on frequency before advising the flight would execute a missed approach. Runway 18R threshold was partially obscured.
- He could not recall the reported visibility prior to the accident.
- The night of the accident, the low level wind shear alert system (LLWAS) alerted only twice during his hour and a half on the LC position.
- Prior to the accident the visibility was "good VFR," he could see USAir flight 806, and USAir flight 797 taxi out and turn from taxiway "E" to runway 18R and could see the entire runway.
- He was not surprised the pilot of USAir flight 806 wanted to delay his departure. "When a pilot wants something for any reason, it is up to the pilot." He could see the aircraft at the runway threshold.
- When the flight crew of USAir 797 advised they wanted to wait to depart, he concentrated on runway 18R. The rain had intensified, visibility had become restricted but he could see aircraft on the ground although not in the air. He did not know if the visibility was obscured by rain or by a "scud layer" which he defined as low clouds.
- When asked about his question to the flight crew "understand you're turning right," he stated he questioned the flight crew because they disregarded the missed approach instructions that he issued and wanted to verify the pilot's intentions.
- He stated that he never saw USA1016 initiate the right turn.
- He saw smoke 30 seconds to 1 minute after the flight crew stated they would execute a missed approach.
- He saw the data tag drop which is normal for aircraft that are landing, he looked at the BRITE and waited to see the data tag come out of the main bang. He called the pilot, but he did not respond.

- He stated that because he knew the pilot was busy "doing the missed approach," he instructed the pilot "when you have time, tell me your heading." He needed the information so he could coordinate with the satellite west controller responsible for the airspace the aircraft would be entering. There was no response from the flight crew of USAir 1016.
- He advised the supervisor and sent the subsequent aircraft (Carolina 5211 an SH36, and USAir 332, a B-727) around.
- When the rain-shower passed, he saw a plume of black smoke, no flames.
- He could clearly see the departure end of runway 18R the whole time, but could not see the 18R threshold at the time of the accident due to either rain or scud. He tried to see USA1016 "on the missed approach" visually, but he could not.
- He stated that when an aircraft is executing a "go around," his first priority is to coordinate with the radar controllers. When the pilot is instructed to "fly runway heading," he knows that the aircraft is entering sterile airspace. However, if the pilot wanted to turn right, he would need to coordinate with the Satellite West controller. He did not coordinate, the supervisor came to do the coordination.
- He stated that one flight crew asked if he saw smoke to the west and he replied, "affirmative."
- He could not recall seeing USA1016 on the downwind leg.
- He did not turn on the runway visual range (RVR) indicator for runway 18R which is located in front of him at the LCW position. He stated that he "did not notice it on, did not turn it on and had no reason to turn it on."
- He stated that he issues the RVR when the prevailing visibility is less than 1 mile. Because the visibility did not go below 1 mile, he did not need to issue it.
- He stated that at the time of the accident his work load was normal, 4-5 aircraft and he felt comfortable.
- At the time of the accident, the supervisor was at the supervisor position monitoring the LCE position.
- He did not see lightning or hear thunder.
- When the LLWAS activated, he saw no gusts although he specifically looked for it.

- He could not recall hearing rain. He determined that it was a "heavy" rain by visual observation, he did not hear it.
- The previous arrival aircraft, USA983, an FK-100, conducted a visual approach to runway 23 and changed to runway 18R. He knew USA983 was going to 18R because the data tag indicated runway 18R. After being asked if there was any benefit to the pilot to land on runway 18R or 23, he indicated that the pilot would taxi the same landing either runway. In conditions such as a thunderstorm, when a pilot requests to change runways, the consensus is to "let him go."
- The night of the accident, the weather "decreased rapidly."
- He stated that the LLWAS has 6 sensors and when one sensor activates, the individual sensor will flash and an aural alarm will sound. He recalled the NE boundary sensor indicated 190 degrees at 21 knots while the centerfield sensor indicated 100 degrees at 19 knots. He stated that he would issue any wind shear alert. For example, if he were working runway 18R and the southeast boundary sensor alerted, he would issue the information. The LLWAS display is visible from everywhere in the tower cab. The second time the LLWAS activated, it was the same boundary.
- It started to rain when USAir 806 taxied on taxiway "E," he saw USA983 land, the visibility was "good" with rain. He watched the rain come in from the south and made a comment about rolling up the windows in his car because it looked like it was going to rain. He recalled that part of runway 18L was under "rain shower."
- When he was asked, "Did you visually look for USAir 1016 before the pilot advised he would execute a missed approach." He replied, "no." He further stated that he did not recall seeing USAir 1016 out the window, but he did scan out the window in the general area that USAir 1016 should have been. This was followed by a discussion of how he uses the D-BRITE to determine the position of an aircraft during times of reduced visibility.
- He could not recall any general conversation in the cab prior to the accident aside from asking another controller to roll up his car windows.
- Controllers broadcast when the ATIS code changes. He could not recall any changes to the ATIS while USA1016 was on frequency.
- He could not recall if the runway lights were on at the time of the accident.
- The individual LLWAS sensors were not selected which would constantly display the wind speed and direction.

- He did not notice anything unusual about the flight path of USA1016.

Fred Vincent Masi

Charlotte Final Radar West Controller

Entered on duty FAA:	September 19, 1983
Entered on duty CLT:	September 19, 1983
CTO Certificate Number [REDACTED]:	September 10, 1982
Tower visibility certification number [REDACTED]:	April 14, 1984
FPL:	December 6, 1985
LLWAS Certification:	July 12, 1991
Most recent tape talk:	March 1, 1994

Mr. Masi was interviewed by the ATC Group on July 4, 1994. In response to questions, he provided the following information:

His date of birth is [REDACTED]. He did not attend the FAA Academy although he graduated from the radar training facility in 1984. He had 6.5 years of ATC experience in the Air Force working in both radar and tower. He is a pilot with a private license, single-engine land rating. He has approximately 250 total flight hours although he is not current. His operating initials are FM. His most recent medical certification was on June 28, 1994 and no waivers or restrictions were required. His immediate supervisor since April 1994 was Jeff Forman. He had not worked any overtime in the last month. He is an FPL. The day of the accident his assigned shift was 1330-2130 local time on the second day of a five day work-week. His previous shift was 1445-2245 local time. Prior to being assigned the Final Radar West (FRW) control position at 1830 local time, he was on break for approximately 30 minutes. He stated that he was in "good" health. He received a complete relief briefing although he could not recall the specific information. He was wearing a headset monitoring the FRW frequency, 119.0. The UHF frequency was on the speaker. The FRW controller is responsible for approaches to runway 18R.

Additionally, he stated that:

- He received a radar hand-off from the arrival controller for USA1016 that was on an "UNARM" arrival from the southwest. He put the aircraft on downwind and instructed the flight crew to make verbal communications with the tower after the flight was established on the localizer.
- He stated that he saw "weather" on the ASR-9 radar display on or around the final approach for runway 23 when USA1016 made initial voice communication while the aircraft was southwest of the airport. He did not notice any "weather" in his airspace or on final to runway 18R.

- Not long after establishing voice communication with the flight crew, he saw "weather" developing on the airport or just north of runway 18R. Due to the light workload and weather conditions, he changed USAir 1016 from an ILS approach to a visual approach to runway 18R and descended the flight to 2,300 feet msl. When he saw the weather develop, he changed the flight back to an ILS and amended the altitude to 3,000 feet msl. He took the initiative to change the type approach on his own, no one instructed him to do so. At the time he changed the aircraft back to the ILS approach, the aircraft was on a mid-field downwind.
- Due to the proximity of the antenna, he saw only a portion of the weather. He stated that the weather appeared as a "level 3," he did not see it as a level 1 or 2, "it just popped up as a level 3." While he was working the FRW position, it did not dissipate and stayed in the same place as a level 3 until there was a controller change about 30 minutes after the accident.
- He stated that the levels 1 and 3 were selected, and that was all that was available. There were no 4, 5, or 6 levels available.
- He stated that the radar range was set for 30 miles and the altitude filter limit was 900-6,000 feet. The FRW controller is responsible for aircraft from the surface to 5,000 feet msl to the northwest of the airport.
- For training on the ASR-9, he stated that he had materials to read and he could not recall if there was a formal class.
- He stated that the Final East controller coordinated to take USA983 from runway 23 to 18R. He told the controller about USA1016 and said, "no factor point out approved." He stated that the flight crew requested the change because of the weather on final to runway 23. He stated that there was weather on final over LECAR (the final approach fix for the localizer back course runway 23 approach.) The aircraft was close enough to the airport to make the circling approach and not conflict with other aircraft.
- He stated that the TRACON controllers receive only the centerfield average portion of the LLWAS system. The tower supervisor advised the TRACON supervisor via the interphone that there was a wind shear. The TRACON arrival wall supervisor (RCA) advised him of the wind shear, but not of the specific information. The supervisor stated the wind shear alert affected all quadrants and he broadcasted this information to aircraft on frequency.
- He stated that the tower visibility was 1 mile which he also broadcasted to aircraft.

- He cleared the aircraft following USA1016, Carolina 5211 (CDL5211), an SH36, for the ILS approach for runway 18R. The weather was about the same for CDL5211 as USAir 1016.
- He stated that after the accident, there was one flight that did not want to execute an approach due to weather on the final near the airport.
- While in communication with USA1016, he considered his work load as "light, maybe 3 aircraft at the most."
- He stated that there was nothing unusual about the route of flight for USA1016.
- He did not receive any low altitude alerts on any aircraft the night of the accident.
- He stated that ATIS information "Yankee" advertised the ILS; however, as long as the weather is above minimum vectoring altitude (MVA) minimums, the visual approach can be used.
- He stated that the weather developed before USA983 landed on runway 18R.
- He advised the flight crew that there was "rain south of the field." When asked where he received this information, he stated that it came from "someone." He could not recall if it came from the tower controllers.
- The radar display indicated that the weather appeared to move south to north.

Donald Dean Southard

Charlotte TRACON Arrival West Controller

Entered on duty FAA:	November 26, 1972
Entered on duty CLT:	February 6, 1983
FPL:	April 1, 1986
Most recent tape talk:	January 25, 1994

Mr. Southard was interviewed by the ATC Group on July 4, 1994. In response to questions, he provided the following information:

His date of birth is [REDACTED] He graduated from the FAA Academy in April 1974. He had 3.5 years experience as a radar air traffic controller in the Air Force. He is not a pilot. His operating initials are SD. His most recent medical certification was in May 1994 with a waiver to wear glasses for near- and far-sightedness. He was wearing glasses the night of the accident. His immediate supervisor since April 1994 was Mike Astorino. He did not work any overtime in the last month prior to the accident. He is an FPL. The night of the accident his assigned shift was 1445-2245 local time. It was first day of a six day work-week because he

traded with a co-worker. He was on break for about 30 minutes before assuming the ARW position. He stated that he was in "good" health the night of the accident. He received complete relief briefing and was wearing a headset monitoring the ARW frequency, 125.35 and there were no frequency on speaker. He stated that the ARW controller is responsible for aircraft inbound to runway 18R unless this is changed by the flow controller. He receives the aircraft from the Atlanta Air Route Traffic Control Center (ARTCC).

Additionally, he stated that:

- He first became aware of USA1016 when the Atlanta ARTCC (ZAT) "flashed the radar target" about 10 miles outside of his airspace boundary. He stated that the flight crew made initial contact and advised that they were at 12,000 feet msl and had received the information on the current ATIS. He advised them to expect runway 18R. When the target crossed into his airspace boundary, he issued a descent to 10,000 feet msl. When the aircraft was approximately 15-17 miles from the airport, the flight crew wanted to deviate for weather. When asked how far ahead they were looking, the pilot stated, "15 miles." The controller told him he would turn 5 miles before that. At 10 miles, he turned the aircraft north for downwind. When the flight crossed the 6,000 foot boundary, he descended USA1016 to 6,000 and "flashed" the radar target to the final controller. After the controller accepted the target, he instructed the flight crew to change frequencies.
- He stated that while he was in communication with the flight crew of USA1016, there was some weather in the center of the airport, but could not see what it was, the radar was not depicting any level. It was right at the "main bang," (over the antenna) there was no intensity.
- He could not recall the weather setting. When USA1016 was inbound, he did not see any weather within the southwest corridor.
- He stated that USA332 and CDL5211 were inbound from the northwest on the "SHINE" arrival. USA1016 was the only arrival from the southwest.
- He was on the control position approximately one and one-half hours.
- He stated that his work load while in communication with USA1016 was "light." No other aircraft requested to deviate.
- When the flight crew of USA1016 indicated that at 2230:09 UTC, "we're gonna swing...5 degrees to the right," he was not depicting anything on the radar display.

- He indicated that some aircraft will ask to deviate when there is nothing depicted on the ASR-9 radar display.
- He indicated that the radar range was set on "variable" and offset to the east displaying 55 miles of radar. The altitude filter limits were 700 feet to 15,000 feet msl.

William "Troy" Huff

Charlotte Tower Local East Controller

Mr. Huff was interviewed by the ATC Group on July 5, 1994. In response to questions, he provided the following information:

His date of birth is [REDACTED] He graduated from the FAA Academy in March 1985. He had 4 years experience as a radar air traffic controller in the Air Force. He is not a pilot. His operating initials are HF. His most recent medical certification was in July 1993 and received no waivers or restrictions. His immediate supervisor is Mark Clark. He did not work any overtime in the last month. His assigned shift the night of the accident was 1445-2245 local time. It was the first day of a five day work-week. He was an FPL assigned the local east control (LCE) position that is responsible for runways 18L/36R and 5/23. He was wearing a headset and monitoring frequencies 118.1 and 257.8. Emergency and guard frequencies, 121.5 and 243.0, were on the speaker.

Additionally, he stated that:

- He was not aware of USA1016 prior to accident. He was not aware that USA1016 was executing a missed approach or go around. He became aware of the possibility of an accident when he saw the smoke after the rain "let up."
- When the tower controllers saw the smoke and couldn't find USA1016, they figured it might be an accident.
- After the accident, the local control west position was combine at the local control east position.
- He stated that the smoke went straight up and there were no flames.
- He stated that he recalled the "radar room" controllers advising of parachute jumping 8 miles southeast of the airport at 2000 feet and below. This had no affect on his operation.
- He could not recall USA983, or any other aircraft, circle from runway 23 to runway 18R.

- He stated that he saw one streak of lightning SSE of the airport, cloud to ground. He heard no thunder.
- He described MERIL as a departure transition area southeast of the airport at the edge of the CLT airspace boundary. He then clarified this to be a radial that starts at the CLT VOR and extends northeast on the 075 degree radial.
- He did not see any reflectivity indicating weather on D-BRITE, but visually saw "weather" develop south-southeast of airport and it did not appear to move. He noticed "moderate" rain south of runway 23. Several moments later, the rain intensified and there was "heavy" rain all over the airport.
- Recalled LLWAS alerts for the northwest and northeast boundary, but he could not recall if there were one or two separate alerts. He stated that the wind shear information was issued to pilots.
- He asked the flight crew of Piedmont flight 3211 (PDT3211) to report clear of runway 23 because he could not see the aircraft due to the rain. He stated that he probably asked the pilot to report off the runway while the aircraft was on landing roll because he normally does not ask questions when pilots are in a critical phase of flight.
- When the rain was the heaviest, he could not see runways 23 and 18R. He could see the approach end of runway 18L almost to the intersection of runway 23.
- He could not see PDT3211 on taxiways Bravo and Mike.
- He could not recall what the weather was like when USAir flight 52, (USA52) a DC-9, departed. He could not recall seeing the aircraft.
- The rain did not appear to move across the field but instead seemed to suddenly appear.
- He recalled receiving some PIREPs. He also recalled requesting one PIREP from a departure and receiving the response of "heavy rain on the roll, clear out of 1000 feet" although he could not remember the type of aircraft giving the PIREP. He requested the information for another aircraft. (Group note: the aircraft giving the PIREP was USA52, an FK-28.)
- He was surprised the inbound flight of PDT3211 reported a smooth ride because it didn't look like it would be smooth.
- When asked about the 2241:08 wind shear alert broadcast, he remembered that the aural alarm caught his attention. He read exactly what was on the LLWAS

display. He indicated that the northeast sensor was the only one in alarm. He made the LLWAS broadcast because the northeast sensor would most directly affect operations on runways 18L and 23. The alert surprised him.

- He could not recall issuing a second LLWAS alert.
- He recalled someone in the cab saying that the visibility had decreased - believes to one mile - but not sure. Looked towards runway 18L and could see about half way down the runway therefore he concurred with the report.
- He recalled that the crash phone was activated by the GCE controller, but could not recall what was said on the phone. There were no operations at the Local Control East and West positions after the crash phone was activated.
- Weather for the D-BRITE was selected but he was not sure what levels were set. Weather levels were available and appeared on the D-BRITE around the time of the accident. He could not recall the level of the weather, but the weather appeared approximately 7 miles in diameter around the main bang.
- The rain came straight down with a "high volume of water" and appeared to be a rapidly developing storm. All rain appeared to come from the same cell.
- When asked about his 2237:33 transmission to PDT3211 about "heavy, heavy rain," he stated that the rain was the heaviest rain he had ever seen.
- Rain could be heard in the tower cab.
- He could recall comments in the tower about a wall of water south of runway 23 and the rest of the airport still being dry. He thought he had this conversation with the tower supervisor.
- He recalled an aircraft sit on the runway so the pilot could look at the radar in the aircraft. He looked out visually and it looked dark to the south/southeast although there was no reflectivity indicating weather on BRITE.
- He indicated that he normally would advise a pilot of a significant weather change.

Bruce Emerson Tarbert

Ground Control (East and West)

Mr. Tarbert was interviewed by the ATC Group on July 4, 1994. In response to questions, he provided the following information:

His date of birth is [REDACTED] He graduated from the FAA Academy in September 1977. He has no military ATC experience. He is a pilot with a commercial license for single-engine land rating, and an instrument rating. He has approximately 450 hours although he is not current. His operating initials are TT. His most recent medical certification was in August 1993 and received no waivers or restrictions. His immediate supervisor since April 1994 was Mitch Ross. He had not worked any overtime in the last month. The night of the accident his assigned shift was 1345-2245 local time. It was the second day of a five day work-week. He was on leave the previous shift. Prior to assuming the ground control position (GC), he was on a lunch break. He received a complete position relief briefing although he could recall the specific information. He was wearing a headset monitoring the east and west GC frequencies, 121.8 and 121.9. He could not recall if the UHF frequency was on headset or on the speaker. He was assigned to the GC position at approximately 1825 local time.

Additionally, he stated that:

- He recalled a conversation between the LCW controller and the supervisor stating USA1016 was executing a missed approach.
- He never saw USA1016 at any time although he recalled looking for the aircraft.
- He saw smoke but no flames. He could not recall the direction of the smoke.
- Regarding the weather conditions, he stated that the rain moved from the south to the north and the visibility was obscured by rain.
- He stated that he looked and saw that it was raining over the cargo terminal but it was not raining on the tower cab.
- USA983 landed on runway 18R after the flight crew broke off the approach to runway 23. He saw the aircraft visually 2 miles north of the field. He determined the aircraft's position by using the D-BRITE. The rain moved in and the visibility was reduced.
- The tower supervisor stated that the visibility was 1 mile although he could not recall who the statement was directed to.
- He saw USA983 turn base to final on the D-BRITE but could not recall seeing the aircraft touch down or roll out. He never visually saw USA1016.
- He observed 2 aircraft (Group note: USA806 and USA797) holding on taxiway "E" waiting for departure.

- He saw the LLWAS activate 3 times. The first activation involved the centerfield wind, the second involved the northeast boundary and the third involved all the sensors and recalled the northwest sensor as 190 degrees at 34 knots. The rain intensified during the second activation. He stated that he did not recall whether or not this LLWAS alert was received prior to, or after the aircraft accident. The last alert occurred when the rain was moving northbound from the south.
- He stated that the weather took 3-5 minutes to move north from the cargo ramp.
- He recalled that aircraft departed runway 18L prior to accident and the flight appeared normal. He stated that there was a discussion about issuing turns to aircraft departing from runway 18L.
- He stated that when he is working the ground control position, he uses the D-BRITE to anticipate what call signs to expect on GC.
- The night of the accident, he did not see reflectivity indicating weather at any time on the D-BRITE.
- He stated that the "extremely heavy rain" developed over the airport in a very short time period. He could hear the rain and, initially, the visibility was lower to the south.
- He recalled the flight crew of USA983 report a "smooth ride." He stated that he received no PIREPs from pilots while working the GC position.
- He activated the crash phone on his own then advised the supervisor. He had a "gut feeling" something was wrong when USA1016 was turning right and USAir Express (CDL) was going around. He believed that "something was wrong." He stated that on the initial call to the Airport Rescue Fire Fighters (ARFF) he advised, "we had lost radar contact with an aircraft." He instructed the vehicles southwest to cross the field via taxiway "A," then via the new taxiway across runway 36L to the CDL Maintenance Hangar. Then he saw the smoke, he directed the vehicles to cross runway 5/23 to continue on to the Terminal ramp then out the gate to Old Dowd Road to Wallace-Neel Road.
- At the time of the accident, he classified his traffic as "light."
- He stated that the visibility decreased south to north and he saw no lightning and heard no thunder.
- Heavy rain developed in a very short time.

- He was relieved from position at 1853 local time as a result of the accident.
- He could not recall weather selection on the D-BRITE. He used the D-BRITE on the east side of the tower for "P" lists (arrival retention list) which are on the bottom left and right of the display. There are two D-BRITE displays in the tower that have their own control panels and share one weather control.
- Controllers are advised of the ATIS change when the code is updated in the systems area of the D-BRITE and verbally announced by the controller. The ATIS code is not displayed on the SAIDs. The controllers then advise pilots of the change. He recalled seeing the 1836 special weather observation before the accident.
- After the accident, his primary responsibility was to determine how to get the crash crew to the aircraft; therefore, he was not concentrating on the rain, clouds, direction of smoke.
- When USAir 983 was circling from runway 23 to 18R, he could see the aircraft easily. The visibility was better north/northeast than south/southwest. He could see beyond the aircraft that was 2 miles away. He could not see any aircraft behind him.
- He recalled the comment by LCE of "heavy, heavy rain" but could not recall hearing any general comments about the rain.
- He pointed out the LLWAS sensor 190/34 value to the LCE controller.
- He did not recall any wind gusts.

James Luther Koon

Charlotte Tower Supervisor

Mr. Koon was interviewed by the ATC Group on July 5, 1994. In response to questions, he provided the following information:

His date of birth [REDACTED] He graduated from the FAA Academy in April 1979. He had no military experience and was not a pilot. His operating initials are JK. His most recent medical certification was April 1994. His immediate supervisor is Craig Guensch. He had not worked any overtime in the last month. The day of the accident he was assigned to work from 1450 - 2250 local time. It was the third day of a five day work-week. The previous two shifts were 1600-0000 local time. He was an FPL. Prior to the accident, he had worked the entire shift with one short break. At the time of the accident he was wearing a headset and monitoring LCE position.

Additionally, he stated that:

- He could recall nothing about USA1016 until the LCW controller advised that USA1016 was "on the go." At that time he began to monitor the LCW position. He went to that position and looked at the BRITE to look for a radar target.
- When no radar target was visible nor communication was established, the crash phone was activated.
- He said he saw smoke approximately 5 - 7 minutes after the flight crew of USAir 1016 advised they were "on the go." It was a large smoke area although he could not determine the direction of smoke. He saw no fire.
- Prior to USA1016 executing a missed approach, there was rain on the airport, and the visibility was rapidly decreasing. He did not see lightning or hear thunder. He recalled the D-BRITE displaying weather 10 miles southeast of airport, with little or no movement; he could not recall the level. He recalled that the weather settings for the D-BRITE were set to level 3 and 4. He could not recall when these settings were made.
- He recalled that an aircraft circled from runway 23 to runway 18R. He overheard conversation from the LCE that the aircraft would circle. He could not recall hearing the coordination but coordination would be normal procedure for aircraft changing runways. One aircraft was landing 23 when visibility was lowering and circling to 18R. He could not recall any weather cells on the final approach to runway 23.
- Within one minute of USA1016 go around, he recalled that the LLWAS alerted, multiple quadrants, and "flashing lights." He believed he heard the aural alarm. He advised the TRACON supervisor of the LLWAS alert information for a new ATIS. He expected that information to be included on the next ATIS and passed to the arrival controllers. He stated that it takes approximately two minutes to record and broadcast an ATIS.
- He could not recall USA806 and USA797 departure aircraft requesting to hold for weather.
- He recalled that the rain moved from the south towards the north/northwest across the field and increased in intensity. The heaviest rain that he recalled was impacting the cargo area. The north/northwest would have been the last area to be impacted.
- There was a National Guard helicopter 8-10 miles southeast of the airport conducting parachute jumping that was at 3,000-4,000 feet which was a lower altitude than originally was coordinated. This was done far enough from the airport to be approved.

- The National Weather Service (NWS) called for a visibility check from the flight data controller who asked the supervisor for a visibility check. The supervisor advised "1 mile" as determined by visual check on the airport. He could see the approach end of runway 5. He could see down runway 18R at least 2/3 of the way down the runway. Visibility at this time was restricted to the south/southeast and better to the north/northwest. Visibility could have gone below 1 mile but he doesn't believe that it did. He stated that "it came upon us very suddenly."
- He stated that the flight data controller was responsible for updating the ATIS with the revised visibility information. Recording and broadcasting an ATIS would take about two minutes.
- At the time of the accident, he considered the workload to be light becoming moderate.
- When the LLWAS alarmed, he guessed that it affected three quadrants. He believed that this occurred at approximately the same time USA1016 executed a missed approach.
- He considered the change of runway for USA983 (circle to land 18R) to be routine.
- He did not consider a runway change from (18L/R to 36L/R) but remembers coordinating for the change from converging to parallel approaches.
- He considers the wind, operational impact, and forecasted weather before deciding on runway changes. When asked if he would be comfortable with 20 knot tailwind, he responded "no".
- He did not believe that the visibility decreased below one mile. He could see 2/3 to 3/4 down runway 18R and could see the threshold of runway 18R.
- USAir 1016 was issued wind 110 degrees at 19 knots which is a tailwind for runway 23. However, he stated, "by the time USAir 1016 was issued these winds, we were using runway 18R and 18L, not runway 23. USAir 1016 was never on an approach for runway 23." He did not consider changing runways due to the wind because he was not aware the wind had picked up that much. He could not recall either local controller alerting him to the wind. There were no pilots who complained of a tailwind. There were no missed approaches to runway 23. When asked if he considered changing to a north operation after converging instrument approaches were terminated with the wind 110 degrees at 21 knots, he stated "no."
- He believed that the LCE stated that he saw lightning.

- Converging operations were terminated due to the visibility. Converging approaches are used only in good visibility in VFR conditions.
- Weather conditions permitting, he normally visually watches aircraft on approach.
- Tower is responsible for calling the NWS when the visibility goes below 4 miles. However, the night of the accident, the NWS called tower for the visibility. He further explained that the weather had developed on the south side of the airport first. The weather bureau is on the southeastern side of the airport. It would not be unusual for them to initiate the call in such a situation.
- The facility uses south operations about 50 percent of the time.
- He generally monitors the LCE because it is a more complex operation with crossing runways, crossing taxiways, FBO ramp, and vehicle activity. The position may require more supervisory input because of the complexity.

On July 14, 1994, the ATC Group Chairman conducted a telephone interview with Mr. Koon. In response to questions, he provided the following information:

- The engine generators were started at approximately 2236 in response to the LCE reporting that he observed lightning southeast of the field.
- At about the same time that the generators were turned on, he "swiped the lights" which meant that he turned on the airport lighting. He could not recall what step the runway lights were on. He did not turn on the RVR.
- When he reported the visibility as one mile, he said it in a "community voice" so it would be heard by all the tower controllers. He did not receive an acknowledgement from anyone.

Mark Francis Schneider

Charlotte TRACON Arrival Supervisor

Mr. Schneider was interviewed by the ATC Group on July 5, 1994. In response to questions, he provided the following information:

His date of birth is [REDACTED]. He did not attend the FAA Academy. He had 5 years experience as an air traffic controller in the Air Force, 4 years in the Ground Control (GCA) and one year in the tower. He is not a pilot. His operating initials are KR. He is an FPL. His most recent medical certification was in October 1993 with the restriction to wear glasses for near- and far-sightedness. He was wearing glasses the night of the accident. His immediate supervisor since April 1994 was Jerry Parish. His assigned shift the night of the accident was 1100-1900. This was the third day of a five day work-week. The previous shifts

were 1400-220 and 1450-2250 local time, respectively. At the time of the accident he was assigned as the TRACON arrival supervisor (SA) and he was at the overhead position, which is located behind the final radar east and west controllers. He was not monitoring any position. Approximately 10 minutes before the accident, he stated that the traffic was "moderate for a hub operation."

Additionally, he stated that:

- He was not aware of USA1016 until a call was received from the tower cab. He was told to hold all aircraft, there were approximately 9. There were 3 aircraft at the arrival west position, 3 at the arrival east position, 3 at the final east and he could not recall the number at the final west position. He stated that this was not a lot of aircraft.
- He recalled that there was weather north-northeast of the airport to 5 miles, expressed as extended centerline of runways 18L & 23 at level 3. He could not recall if there were higher levels.
- He asked the tower if there was any lightning and the tower replied, "affirmative." He was also briefed that the visibility was not very restricted, just hazy. He believed this occurred approximately 15 minutes prior to the accident.
- Prior to the USA1016 go around, the tower cab called down with a wind shear alert, all quadrants. He heard at least one controller in the TRACON issue the alert over the frequency.
- He noticed that the centerfield wind was 110 degrees at 20 knots.
- His span of arrival airspace control extends from 5 to 50 miles from the airport.
- He assumed that USA983 changed runways because of the wind picking up out of the east. He told the tower that if USA983 needed to go around, they should send the aircraft westbound, not north.
- Could not recall receiving any PIREPs.
- The parachute jump was pre-coordinated for 8,500 feet and below but was amended to 3,500 feet and below, because of he was anticipating deviations around weather on the MERIL departures.
- He recalled questioning the tower supervisor about the visibility south of the airport affecting the converging operation. Tower supervisor indicated that it looked "OK for now" but would have to discontinue converging eventually.

- He stated that controllers make their own decisions on the weather settings on the ASR-9, unless the supervisor wants to look at something special.
- He could not recall being advised of any post accident LLWAS alerts.
- Tower supervisor told him it was "raining like hell, tower visibility 1 mile."
- At the time of the accident the work load in the TRACON was considered moderate but normal.
- The remarks section of the weather that should be on the ATIS. He gave some examples of what would be included in the ATIS: tower visibility if different than the NWS, wind shear, SIGMETs within 50 miles. He stated that there is a cue card at the top of the desk to make a note when an LLWAS is issued. He does not need to advise controllers to put this information on the ATIS. There is no LLWAS information written to remind the flight data controller to include the wind shear on the ATIS. The TRACON flight data controller records the arrival ATIS. When the weather is recorded depends if the controller sees or hears the weather come out of the machine. There is a three second aural alarm. They should then stop what they're doing and make the ATIS. NWS does not advise that a special observation is coming out. The ATIS can be broadcast usually within 2 minutes. The flight data controller advises the supervisor to monitor the ATIS then walks around to the controllers with the new ATIS code and the ATIS code is typed in the system area.
- Time code on the radar scope is checked every 8 hours. If an ARTs scatter is done, there could be 20-30 second delay in resetting the clocks. Normally there could be a time difference of between 4-5 seconds from the system time and WWV in Colorado Springs, Colorado.
- Maintenance is responsible for time check on voice recorders.

Mark Clark

Charlotte TRACON Departure Wall Supervisor

Mr. Clark was interviewed by the ATC Group on July 6, 1994. In response to questions, he provided the following information:

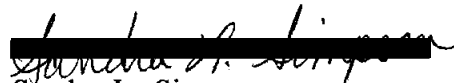
- While working RCD he received a call from the tower supervisor coordinating a go-around on runway 18R for USAir 1016. He issued missed approach instruction at which point the tower supervisor advised that he was unable to issue the instructions. He then received a telephone call from Metro police and was asked if "we had a downed aircraft." He responded "no ma'am" and she advised of reports of a downed aircraft at Old Dowd Road. the operator then asked if he wanted her to stay on the line while he checked. he responded "No, I have some


other things going on." She replied, "okay" at which point the call was terminated. He then asked the TMC where the "go around" was. He pointed to a commuter aircraft. He stated, "no not him, USAir 1016." He said he did not know. He then called the tower supervisor to find out the status of USAir 1016. The tower supervisor said he did not know.

- Tower called back to coordinate two additional "go arounds" and Mr. Clark asked if the tower rolled the crash crew and told the tower supervisor of the police call and the reports of the downed aircraft. He then informed the area manager of a possible downed air carrier.
- He stayed on position until 1902 then asked to go to the tower to relieve the tower supervisor. When he assumed the supervisory responsibilities at 2305 in the tower cab, the LCE and LCW positions were open.
- The airport was never closed but there were no arrivals or departures immediately; however, operations "certainly" resumed within 30 minutes.
- He saw the smoke going up.
- Prior to assuming the departure wall supervisor position, he was working the DRW position for currency.
- He stated that there were some weather cells 7-18 miles northeast in a level 3, but he saw nothing over the airport.
- He could not recall anyone saying anything about the wind shear.
- He could not recall the wind.
- He stated that he had no aircraft deviate for weather but heard coordination for arrival deviations. He heard the discussions from the arrival wall not the departure wall.
- After going to the tower he knew the "Blaze equipment" (ARFF) was at crash site although he did not see them go. One Blaze vehicle went back to the fire station but he could not recall the time.
- The police department asked Mr. Clark if he wanted her to wait while he checked about the "downed aircraft." He said, "no we have some other things going on." He stated this was because he wanted him to find out status of USA1016 that was "going around." There are procedures in effect in the tower in the event an aircraft goes down. If they had an aircraft go down or if the tower supervisor

suspected a "downed aircraft," he was certain ARFF would be notified. "I called the tower supervisor to make sure he had done that."

- He did not receive any further calls from the police.
- He advised the area manager of a possible downed air carrier.
- After he went to the tower and relieved the supervisor, he then changed the runway operations to the north because of the wind. He conducted the normal coordination for changing runways. The tower supervisor, after coordinating with the TRACON supervisor, decides if there should be a runway change.


Sandra L. Simpson
Air Traffic Control Group Chairman


AS-30
8-22-94