NATIONAL TRANSPORTATION SAFETY BOARD

Washington, D.C.

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In the Matter of: :
: :
THE INVESTIGATION OF THE U.S. :
AIR FLIGHT 1016, DOUGLAS DC-9-30 :
: :
CHARLOTTE, NORTH CAROLINA : DOCKET NO. SA-509
JULY 2, 1994 :
(DCA-94-MA-065) :
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Charlotte Marriott Executive
Park Hotel
Charlotte, North Carolina

Monday, September 19, 1994

The above-entitled matter came on for hearing pursuant to notice, before JOHN HAMMERSCHMIDT, Chairman, at 12:00 p.m., before:

Board of Inquiry

John Hammerschmidt, Member, NTSB
Chairman

Ronald Schleede, Chief,
Major Investigations Division, Hearing Officer

Bud Laynor, Deputy Director of
the Office of Aviation Safety

John Clark, Chief, Vehicle Performance Division,
Office of Research and Engineering

Technical Panel

Gregory Feith, Investigator-in-Charge

Renee Mills, Operations Investigator

Barry Strauch, Human Performance Investigator

Hank Hughes, Survival Factors Investigator

Jim Ritter, Aircraft Performance Engineer

Sandy Simpson, Air Traffic Control Investigator

Nora Marshall, Senior Survival Factors Investigator

Larry Roman, Airport Investigator

John DeLisi, Aircraft Systems Engineer

Jack Young, Powerplant Specialist

Greg Salottolo, National Resource Specialist, Meteorology

Staff:

Alan Pollock, Office of Public Affairs

David Bass, Deputy General Counsel

Pam Wehner, Special Assistant

Eunice Bellinger

Jan DeLorge

Rhonda Underwood

National Transportation Safety Board
National Safety Transportation Board
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Parties to the Hearing

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Association of Flight Attendants
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International Association of Machinists
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C O N T E N T S

P R O C E E D I N G S

(Time Noted: 9:00 a.m.)

CHAIRMAN HAMMERSCHMIDT: I am John Hammerschmidt, Member of the National Transportation Safety Board and Chairman of this Board of Inquiry.

At this hearing, we are considering an accident that occurred on July 2, 1994, at Charlotte, North Carolina, involving USAir, Inc., flight 1016.

The hearing is being held for the purpose of supplementing the facts, conditions, and circumstances discovered during the on-scene investigation. This process will assist the Safety Board in determining the

probable cause and in making any recommendations to best prevent similar accidents.

This inquiry is not being held to determine the rights or liability of the parties to the investigation, and matters dealing with such rights or liability will be excluded from these proceedings.

Over the next several days of this hearing, we will collect information that will assist the Safety Board in determining how and why this accident occurred. Specifically, we will concentrate on the following issues -- and there is no significance in the ordering of the issues:

1. Airline pilot training and procedures with regard to wind shear identification and remedial action.

2. Crash/Fire/Rescue response and coordination between the airport CFR unit and the local police and fire departments.

3. ASR-9 and Doppler Weather Radar installation and use in the Charlotte air traffic control facility. Also, controller training in the use of such equipment.

4. Possible degradation of aircraft

performance during in-flight encounters with substantial amounts of rainfall and excessive water on the wings.

5. Airport responsibility for CFR response and information dissemination procedures.

6. Cabin Safety - the use of child safety seats on commercial aircraft for children under 2 years of age.

At this point, I would like to introduce the other members of the Board of Inquiry. They are:

Mr. Ronald Schleede, Chief, Major Investigations Division. Mr. Schleede is also the Hearing Officer.

Mr. Bud Laynor, Deputy Director of the Office of Aviation Safety.

And, making his entrance, Mr. John Clark, Chief, Vehicle Performance Division, Office of Research and Engineering.

The Board of Inquiry will be assisted by a Technical Panel. These persons are -- and when I read your name, will you please stand up so people in the back can see who you are:

Mr. Gregory Feith, Investigation-in-Charge of

this investigation.

Ms. Renee Mills, Operations Investigator.

Dr. Barry Strauch, Human Performance Investigator.

Mr. Jim Ritter, Aircraft Performance Engineer.

We will also have another person, who I don't believe is here this morning, Mr. Hank Hughes, Survival Factors Investigator.

Ms. Sandy Simpson, Air Traffic Control Investigator.

We will also have later on in the hearing, Ms. Nora Marshall, Senior Survival Factors Investigator.

Also later in the hearing, Mr. Larry Roman, Airport Investigator.

Mr. John DeLisi, Aircraft Systems Engineer.

Mr. Jack Young, Powerplant Specialist. He will join us later in the hearing.

Mr. Greg Salottolo, National Resource Specialist, Meteorology.

And we also have additional Safety Board staff with us at the hearing. Could they please stand

for everyone's reference?

(Staff are recognized.)

CHAIRMAN HAMMERSCHMIDT: Thank you. Neither I nor any other Safety Board personnel will attempt during this hearing to analyze the testimony received nor will any attempt be made at this time to determine the probable cause of the accident. Such analyses and cause determinations will be made by the full Safety Board after consideration of all of the evidence gathered during our investigation.

The report on the subject accident reflecting the Safety Board's analyses and probably cause determinations will be considered for adoption by the full Board at a later public maintenance, which will be held at the Safety Board's Headquarters in Washington, D.C.

The Safety Board's rules provide for the designation of parties to a public hearing. In accordance with these rules, those persons, governmental agencies, companies, and associations whose participation in the hearing is deemed necessary in the public interest and whose special knowledge will contribute to the development of pertinent evidence are

designated as parties. The parties assisting the Safety Board in this hearing have been designated in accordance with these rules.

As I call the name of the party, will its designated spokesperson please give his or her name, title and affiliation for the record:

The Federal Aviation Administration.

MR. DONNER: Mr. Chairman, my name is Bud Donner. I'm the manager of the Accident Investigation Division, Federal Aviation Administration in Washington.

CHAIRMAN HAMMERSCHMIDT: Thank you, Mr. Donner.

USAir, Inc.

MR. SHARP: My name is Gene Sharp. I'm the Vice President of Flight Operations for USAir.

CHAIRMAN HAMMERSCHMIDT: Thank you, Mr. Sharp.

Air Line Pilots Association.

MR. TULLY: My name is Robert Tully. I'm the Chief Accident Investigator for the Airline Pilots Association at USAir.

CHAIRMAN HAMMERSCHMIDT: Thank you, Captain

Tully.

Association of Flight Attendants.

MS. GILMER: My name is Nancy Gilmer. I'm the Master Technical Council Safety Chairperson.

CHAIRMAN HAMMERSCHMIDT: Okay. Nancy, could you spell your last name for everyone?

MS. GILMER: G-I-L-M-E-R.

CHAIRMAN HAMMERSCHMIDT: Thank you. International Association of Machinists. And I believe that Mr. Goglia will be here later this afternoon.

MR. TULLY: Yes, that's correct. Mr. Goglia intends to be the public spokesman for the IAM and he should be arriving by about 2:00.

CHAIRMAN HAMMERSCHMIDT: Thank you. For the record, that spokesperson's name is John Goglia, G-O-G-L-I-A.

Douglas Aircraft Company.

MR. LUND: Mr. Chairman, my name is Steven Lund, L-U-N-D. I am the Director of Aviation Safety Investigations for the Douglas Aircraft Company.

CHAIRMAN HAMMERSCHMIDT: Thank you, Mr. Lund. Honeywell, Inc.

MR. THOMAS: My name is Hal Thomas. I'm a

Staff Engineer and Lead of Honeywell's Air Safety Investigation team.

CHAIRMAN HAMMERSCHMIDT: Could you repeat your name again, please?

MR. THOMAS: Hal Thomas. The first name is H-A-L.

CHAIRMAN HAMMERSCHMIDT: Thank you, Mr. Thomas.

The National Air Traffic Controllers Association.

MR. PARHAM: My name is Gary Parham. I'm the Senior Air Safety Investigator for the National Air Traffic Controllers Association.

CHAIRMAN HAMMERSCHMIDT: Could you spell your last name for the record?

MR. PARHAM: P-A-R-H-A-M.

CHAIRMAN HAMMERSCHMIDT: Thank you, Mr. Parham.

Pratt and Whitney.

MR. YOUNG: Mr. Chairman, my name is Michael Young. I'm the Accident Investigation Coordinator for Pratt and Whitney.

CHAIRMAN HAMMERSCHMIDT: Thank you, Mr.

Young.

National Weather Service.

MR. KUESSNER: Yes, sir. My name is Robert Kuessner. I'm the Aviation Safety and Evaluations Program Leader, National Weather Service Headquarters in Silver Spring, Maryland.

CHAIRMAN HAMMERSCHMIDT: Thank you, Mr. Kuessner.

The Dispatchers Union.

MR. SCHUETZ: Mr. Chairman, my name is Peter Schuetz. I'm Safety Chairman for TWU, Local 545.

CHAIRMAN HAMMERSCHMIDT: Thank you, Mr. Schuetz. Could you pronounce your last name again?

MR. SCHUETZ: Schuetz, S-C-H-U-E-T-Z.

CHAIRMAN HAMMERSCHMIDT: Schuetz.

MR. SCHUETZ: Yes, sir.

CHAIRMAN HAMMERSCHMIDT: I want to publicly thank all of the parties for their assistance and the cooperation they have displayed as we have worked together in the investigation of this accident.

On September 13, 1994, the Board of Inquiry held a prehearing conference in Washington, D.C. It was attended by the Safety Board's Technical Panel and

representatives of the parties to the hearing. During that conference, the areas of inquiry and the scope of the issues to be explored at this hearing were delineated and the selection of the witnesses to testify to these issues was finalized.

Copies of the witness list developed at the prehearing conference are available at the press table, and a set of exhibits to be used in this proceeding is available for review there.

The witnesses testifying at this hearing have been selected because of their ability to provide the best available information on the issues. The first witness will be the Investigator-in-Charge of the accident investigation who will summarize certain facts about the accident and the investigative activities that have taken place since then.

The witnesses will be questioned first by the Board's Technical Panel, then by the designated spokesperson for each party to the hearing, followed by the Board of Inquiry.

As Chairman of the Board of Inquiry, I will be responsible for the conduct of the hearing. I will make all rulings on the admissibility of evidence and

all such rulings will be final.

The record of the investigation including the transcript of this hearing and all exhibits entered into the record will become part of the Safety Board's public docket on this accident and will be available for inspection at the Board's Washington office. Anyone wanting to purchase the transcript should contact the court reporter directly.

Please note: The parties also have to order their own transcripts because the NTSB only orders copies for its own use.

There are a few other people I would like to recognize at this time. They are:

Mr. Alan Pollock from the Safety Board's Office of Public Affairs, who is at the press table. Alan is standing.

Mr. David Bass, the Safety Board's Deputy General Counsel, who will assist in the resolution of any legal matters.

Ms. Pam Wehner, my Special Assistant.

Also, Ms. Eunice Bellinger, Ms. Jan DeLorge, and Ms. Rhonda Underwood are here to handle the administrative matters dealing with the hearing.

In order to make the best use of all of our time during the course of this hearing, my initial plan is to go today until about 6:00 p.m., I would guess. Then to begin each of the other days at between 8:00 and 9:00 a.m.; take perhaps an hour and half lunch break; then continue until about 6:00 p.m. with breaks approximately every hour and a half.

I'm informed that today we will only go until 5:00 p.m., because this room needs to be used for some other purpose. But that's the general plan in terms of what our schedule looks like.

Of course, we have a great many witnesses to cover in that limited amount of time. Hopefully, we will be able to do that without extending either into the evening or starting earlier in the day.

I thank you for your cooperation in that respect.

Mr. Schleede, as Hearing Officer, have all of the exhibits been entered in the public docket?

MR. SCHLEEDE: Yes, sir.

CHAIRMAN HAMMERSCHMIDT: Thank you. I will call the first witness. Mr. Gregory Feith, Investigator-in-Charge, will you please come forward

and take the witness stand?

GREGORY FEITH, INVESTIGATOR-IN-CHARGE, NTSB

Whereupon,

GREGORY FEITH,

having been first duly sworn was called as a witness herein and testified as follows:

MR. SCHLEEDE: Mr. Feith, would you please state your full name and business address for our record?

MR. FEITH: Gregory A. Feith, Washington, D.C.

MR. SCHLEEDE: And you are employed by the

NTSB?

MR. FEITH: That's correct.

MR. SCHLEEDE: How long have you been employed by the NTSB?

MR. FEITH: Approximately 14 and a half years.

MR. SCHLEEDE: What is your present position?

MR. FEITH: I am a Senior Air Safety Investigator.

MR. SCHLEEDE: Could you please briefly describe your experience and education that qualifies you for your position?

MR. FEITH: I graduated from Embry-Riddle Aeronautical University with a bachelor of science degree in aeronautical studies. I was employed by the NTSB back in 1980, at which time I was a field investigator. I worked in our field office in Denver and Los Angeles combined for approximately 12 years. i was promoted to the unit supervisor of the Northeast Regional Office in 1990. I served in that capacity for approximately two years before transferring down to Washington, D.C. as a Senior Air Safety Investigator. And that is the position that I am currently in.

MR. SCHLEEDE: Do you have any aeronautical ratings?

MR. FEITH: Yes, sir, I do. I hold an Airline Transport Pilot certificate with a single and multi-engine land airplane ratings.

MR. SCHLEEDE: Approximately how much total flying time do you have?

MR. FEITH: Twenty-eight hundred hours approximately.

MR. SCHLEEDE: Do you have an opening statement you want to read for us, please?

MR. FEITH: Yes, sir. On July 2, 1994, the National Transportation Safety Board was notified of the accident involved USAir Flight 1016, a Douglas DC-9-31 registered as November-954-Victor-Juliet, VJ [N954VJ], which occurred at the Charlotte/Douglas International Airport in Charlotte, North Carolina. Mr. Phillip Powell of the National Transportation Safety Board's Atlanta Field Office initially responded to the accident site to coordinate the activities until the go-team arrived. The full "GO TEAM" was dispatched out of Washington, D.C. within three hours of the accident and traveled to Charlotte via the FAA G-4

aircraft.

The investigative team that responded on-site consisted of myself as the Investigator-In-Charge; an investigator for operations, human performance, aircraft structures, aircraft systems, powerplants, air traffic control, meteorology, aircraft performance, airports, survival factors, and cabin safety. Other specialties involved in the investigation, but no on-scene were specialists for the flight data recorder and the cockpit voice recorder readouts.

All of the groups were under my direction and chaired by an NTSB staff investigator. The investigative team was accompanied to Charlotte by Member John Hammerschmidt and Mr. Alan Pollack from the NTSB office of Public Affairs.

Upon arrival in Charlotte, an organizational meeting was conducted and the following organizations were designated as parties to the investigation and party members were assigned to particular working groups:

The Federal Aviation Administration, USAir, ALPHA, the Association of Flight Attendants, Douglas Aircraft Company, the National Air Traffic Controllers

Association, Pratt and Whitney, National Weather Service, the Union representing the dispatchers, the Transportation Workers Union. And Honeywell was added as a party to the investigation after the on-scene portion of the investigation was conducted.

The cockpit voice recorder and digital flight data recorder were recovered from the wreckage and returned to the NTSB laboratories in Washington, D.C. for a readout. The factual reports regarding the specific information from the CVR and FDR are provided as exhibits to this hearing and have been placed in the public docket. Additionally, other pertinent information not discussed or presented in this hearing will also be included in the public docket and discussed in the Board's final factual report.

Regarding the scope of the investigation, there were many facets of the field phase that went beyond the routine documentation of what occurred during the accident. The various areas of additional investigation have bene pursued quite thoroughly by the NTSB with considerable support by the party specialists. Although some of these areas will be further discussed during the course of this hearing,

the investigation into all areas will continue after this hearing is concluded.

I would now like to brief the history of flight 1016:

On July 2, 1994, at 1843 eastern daylight time, a Douglas DC-9-31, owned by USAir, Inc., and operating as flight 1016, collided with trees and a private residence during the execution of a missed approach from the instrument landing system (ILS) approach to runway 18R at the Charlotte/Douglas International Airport. The captain and one flight attendant received minor injuries; the first officer, two flight attendants and 18 passengers sustained serious injuries; and 37 passengers received fatal injuries.

The aircraft was destroyed by impact forces and a post-accident fire. Instrument meteorological conditions prevailed at the time of the accident, and instrument flight rules flight plan had been filed. Flight 1016 was being conducted under Title 14, Part 121 of the federal regulations.

On the morning of the accident, the captain had commuted to Pittsburgh from his home in Ohio and

joined the first officer approximately 0945 that morning for their reported duty time. Their trip sequence, which was the first of a three-day trip, began approximately one hour later and was scheduled to include en route stops at New York, Charlotte, Columbia, and then finally terminate at Memphis later that evening.

The accident flight departed Columbia at 1823 and arrived in the Charlotte area approximately 1835, 6:35 local time. During the initial descent, the crew had been receiving vectors to the airport. They were advised to expect a visual approach to runway 18R and had been monitoring the weather using the on-board color weather radar.

The captain stated that he had viewed two cells, one located south of the airport and a second, smaller cell located to the east.

The on-board radar depicted the cell to the south with a red center, surrounded by yellow.

At approximately 1836 when the airplane was about nine miles from the airport, the approach controller told the crew of flight 1016, "May get some rain just south of the field. Might be a little bit

comin' off north. Just expect the ILS now."

Shortly after receiving this transmission, the crew discussed the weather and decided that in the event they had to execute a go around, they would alter their course to the right of the runway, rather than fly straight ahead as depicted on the approach plate. They were cleared for the ILS approach at 1838 or 6:38 local time.

Approximately four minutes later when flight 1016 was about three miles from the runway, the airplane encountered light rain followed by heavy rain. The tower controller issued a wind shear alert to flight 1016 at 1841:06 and reported the northeast boundary wind to be from 190 degrees at 13 knots.

At 1842:14, the captain instructed the first officer to, "Take it around. Go to the right."

Following the command by the captain for "max power" and the first officer's command for "flaps to 15," the CVR recorded the captain to say, "Down. Push it down."

The flight crew stated that the visibility was restricted by rain during the initial portion of the go-around. They did not recall seeing a positive

rate of climb on the vertical speed indicator. And they felt a "severe sink rate."

About six seconds later, the sound of the on-board ground proximity warning system sounded and also a sound similar to that of the stickshaker activating were recorded followed by the sound of ground impact. The pilots, controllers and other relevant witnesses will elaborate further on the details of the accident flight during this hearing.

The airplane struck the ground on airport property, approximately 2,100 feet south of runway 18R in a slight right wing low, nose low attitude, on a magnetic heading of about 240 degrees. The airplane cut a swath through a stand of pine and oak trees, continued through the airport boundary fence, and broke into several large pieces on Wallace Neel Road. The empennage came to rest embedded into the side of a private residence.

Post accident examination of the aircraft revealed no evidence of a mechanical malfunction or failure of the aircraft structure, flight control systems or powerplants. The landing gear was found in the down and locked position. The flaps were in the

15-degree down position. Investigative activities that are continuing include additional aircraft performance analysis and wind-field modeling. However, aircraft performance will be discussed at this public hearing.

Some brief general information about the captain of flight 1016 had accumulated about 8100 hours of total flight time, of which 1,900 hours were in the DC-9. The first officer had a total flight time of approximately 12,000 hours with over 3,000 in the DC-9.

Witness descriptions that were obtained during the portion of the investigation that we were on-scene described the weather as being, "Heavy rain, restricted visibility." And in one statement, they described the winds as being, "Extremely violent."

Several working groups participating in this investigation have identified the need to glean additional information related to the issues stated by Chairman Hammerschmidt. These areas include: USAir simulator training, normal and abnormal procedures, recognition of wind shear, the pilots use of on-board weather radar, pilot decision making and situational awareness, FAA oversight of USAir, on-board wind shear detection systems, airline boarding and verification

procedures for passengers and infants, and installation and use of the low level wind shear alert systems, the LLWAS system.

This concludes my summary of the status of the information into the accident involving USAir flight 1016.

At this time, I would like to enter into the public record the exhibits that will be used during the course of this hearing for witness testimony. A list of those witness exhibits have been provided to the court reporter.

CHAIRMAN HAMMERSCHMIDT: Thank you, Mr. Feith.

I'd like to call the first witness of the hearing, Mr. John Welch. He is with the National Weather Service.

Mr. Welch will be questioned by Greg Salottolo.

JOHN WELCH, WEATHER OBSERVER, NEWS, CHARLOTTE, NORTH CAROLINA

Whereupon,

JOHN WELCH,

having been first duly sworn was called as a witness herein and testified as follows:

MR. SCHLEEDE: Mr. Welch, could you state your full name and business address for the record, please?

THE WITNESS: Yes. John P. Welch. I work at the National Weather Service in Charlotte, North Carolina.

MR. SCHLEEDE: What position do you hold?

THE WITNESS: Weather Service Specialist.

MR. SCHLEEDE: How long have you held that position?

THE WITNESS: Approximately 25 years.

MR. SCHLEEDE: Could you describe briefly your education experience over the years?

THE WITNESS: Educational experience is generally several in-house courses, plus also several correspondence courses with different meteorology colleges across the country.

MR. SCHLEEDE: Do you hold any FAA ratings?

THE WITNESS: No.

MR. SCHLEEDE: Thank you. Mr. Salottolo will begin the questioning.

MR. SALOTTOLO: Thank you, Mr. Schleede. Mr. Schleede, could you provide Mr. Welch with Exhibits 5-A and 5-B, please?

(The witness is proffered the document.)

MR. SALOTTOLO: Mr. Welch, can you hear me okay?

THE WITNESS: I'm still finding it.

(Pause.)

THE WITNESS: Yes, I have it.

MR. SALOTTOLO: Mr. Welch, what shift did you

work on July 2, 1994?

THE WITNESS: The 4 to midnight shift.

MR. SALOTTOLO: Were you the only one working that shift?

THE WITNESS: Yes, sir.

MR. SALOTTOLO: How many years have you been a weather service specialist at Charlotte?

THE WITNESS: Approximately 11 years.

MR. SALOTTOLO: I wonder if you might detail briefly your duties and responsibilities as weather service specialist?

THE WITNESS: Our duties vary. One of the most important ones is I've taken up surface observations. The only thing that takes precedence over that is the issuance of public warnings, such as severe thunderstorms or tornadoes or flash flood warnings.

MR. SALOTTOLO: So your only aviation responsibility is the making and dissemination of surface weather observations?

THE WITNESS: Yes, sir.

MR. SALOTTOLO: Was there a priority of duties?

THE WITNESS: Yes, sir. The -- as I said, the only priority that takes over above surface observations is the issuance of public warnings.

MR. SALOTTOLO: Mr. Welch, could you refer to -- please refer to Exhibit 5-B, page 5? These are the surface weather observations for Charlotte for July 2, 1994. The observations at 1651, 1736, 1740 and 1750 eastern standard time. You had an hour to get to local time, which was eastern standard time. Are these the observations you made that afternoon and evening?

THE WITNESS: Yes, sir.

MR. SALOTTOLO: I wonder if we might go through each observation and go through how each of the elements of the observation were determined. Let's start with 1751 eastern daylight time.

THE WITNESS: Do you want me to just -- okay. At that time -- I take it that's a 1651 actually?

MR. SALOTTOLO: Yes.

THE WITNESS: Okay. At that time before I actually gathered the information, I went up onto my usual point of observation, which is on top of the weather office at Charlotte-Douglas International Airport. I observed scattered clouds at about 5,000

feet above the ground. The visibility was six miles. And I added haze as an obstruction division.

MR. SALOTTOLO: Okay. And this is a prevailing visibility?

THE WITNESS: Yes, sir.

MR. SALOTTOLO: Which was determined by reference to the distance of known objects from the observation --

THE WITNESS: Yes, sir. To the east of the airport, we have the city of Charlotte, which I could see pretty clear. However, there was some haze, but I could still see it fairly clear.

To the south of Charlotte, we have the WSOC Charlotte radio station towers.

To the north, we have the control tower, which is one mile from the office.

MR. SALOTTOLO: Now, the temperature and dew point were obtained off direct reading of dials?

THE WITNESS: Yes, sir. We have -- we have instruments out on the field, which are brought in through telephone lines and are located at the observer console.

MR. SALOTTOLO: And you have the wind and

then you have altimeter setting, and direct reading?

THE WITNESS: Yes, sir.

MR. SALOTTOLO: The observation at 1836 eastern daylight or 1736 eastern standard time, can you go over element by element, please?

THE WITNESS: Okay. At that time just prior to this observation, I was in the hallway of the weather office in which I heard a loud clap of thunder. I then proceeded to my normal observation point on top of the weather office and observed lightning and also heard thunder again.

I also observed the visibility was still at six miles and light rain had started.

I came down and into that observation into the MAPSOL system, which automatically computes for us the observation in which then I transmitted up to the tower.

MR. SALOTTOLO: The MAPSOL system is the long line transmission --

THE WITNESS: Yes, sir.

MR. SALOTTOLO: -- dissemination system?

THE WITNESS: Yes, sir.

MR. SALOTTOLO: And the local system is known

as AWIS?

THE WITNESS: Yes, sir.

MR. SALOTTOLO: Would you care to make a stab at what AWIS stands for?

THE WITNESS: I don't know.

MR. SALOTTOLO: Might it be the Aviation Weather Information system?

THE WITNESS: I cannot recall what it actually stands for.

MR. SALOTTOLO: Okay. Now, the reason for the special observation at this time was the thunderstorm?

THE WITNESS: Yes, sir. We have a requirement in the weather service that any time a weather storm begins or ends, that is required special observation.

MR. SALOTTOLO: The 1740 local time -- or eastern standard time, 1840 eastern daylight time observation?

THE WITNESS: At that time, sir, I took another -- my usual point of observation, and recorded the thunder storm. Now, the rain at that time had increased to heavy rain and the visibility had dropped

the one mile. And that is the reason for that special observation.

MR. SALOTTOLO: Now, the visibility, can you just explain in a little more detail how you made that determination of one mile?

THE WITNESS: To the best of my recollection, sir, that was transmitted down from the tower. At times when the visibility drops below four miles, we will either notify the tower or they will notify us in which we take appropriate action.

MR. SALOTTOLO: So it's your testimony that the tower called you indicating a one-mile visibility or change from -- or change to one miles?

THE WITNESS: To the best I can recollect, yes.

MR. SALOTTOLO: At the end of that observation, there is some RVR information. First of all, it's R-36-L-CV. Is that the CV --

THE WITNESS: That is a misprint. That was supposed to be LVR.

MR. SALOTTOLO: Can you just kind of explain briefly what that remark means?

THE WITNESS: Yes, sir. When the visibility

drops to a mile or less, the weather service has a requirement to make an entry in my section of the observation, what the reading reads on the one-way visual range graph. We have that located in the observer console at the weather office. It's generally a ten-minute mean. That means it's running about 6,000 plus, I believe that.

MR. SALOTTOLO: Now, to make this determination, you used the data from the runway 36 left transmisometer?

THE WITNESS: Yes, sir.

MR. SALOTTOLO: And that's the only one you use; you don't use any of the others?

THE WITNESS: Please repeat that.

MR. SALOTTOLO: That's the only transmisometer you use to compose these remarks?

THE WITNESS: Yes, sir.

MR. SALOTTOLO: The 1750 eastern standard or 1850 eastern daylight time observation?

THE WITNESS: That was my regular record special -- my regular record observation, which again continued the thunderstorm with heavy rain and haze. The ceiling was running at that time measured 4500 feet

overcast. That's 4500 feet above the surface.

The temperature at that time was 77. And the winds were generally from the east, 080 degrees at five miles an hour.

MR. SALOTTOLO: All of these observations, the 1751 through 1850 local time, were transmitted long line and locally?

THE WITNESS: Yes, sir.

MR. SALOTTOLO: Getting back to the 1850 observation, 1850 eastern daylight time, on the RVR; is there a requirement to take a special observation when the RVR drops below 2400 feet?

THE WITNESS: No, sir.

CHAIRMAN HAMMERSCHMIDT: Mr. Salottolo, just a point of clarification. When you said 1850, are you meaning 1850 or 1750 on the last question?

MR. SALOTTOLO: It's 1750 eastern standard time and 1850 eastern daylight time.

CHAIRMAN HAMMERSCHMIDT: I just wanted to be clear on that.

MR. SALOTTOLO: Let me repeat the previous question. There is no special criteria based on 2400 feet RVR?

THE WITNESS: If it stays down to under 2400 feet for ten minutes or more, yes, but not just going down and coming back up, no.

MR. SALOTTOLO: Okay. Again, looking at the RVR information at the end of that observation, 1850 eastern standard observation, is there a requirement if the RVR drops below 6,000 feet during that preceding ten-minute; would that be included in that RVR observation?

THE WITNESS: I'm not sure, sir.

MR. SALOTTOLO: You're not sure of the question or you're not sure of the --

THE WITNESS: I'm not sure of the question.

MR. SALOTTOLO: You're not sure of the question. Okay. Could you look at Exhibit 5-B, in which you have page 12. I'm sorry. That's not the correct one here.

If you look at 5-A, and that would be attachment 5, Exhibit 5-A, attachment 5.

(Pause.)

MR. SALOTTOLO: Do you have that?

THE WITNESS: Yes, sir.

MR. SALOTTOLO: Can you identify that

document, please?

THE WITNESS: That's a copy of the RVR chart with 36 left.

MR. SALOTTOLO: And that was available at weather service office?

THE WITNESS: Yes, sir.

MR. SALOTTOLO: If you could look at the times between 1740 chart time, 1740 and 1745?

THE WITNESS: Yes, sir.

MR. SALOTTOLO: Okay. It indicates a -- it looks a spike in the transmittance?

THE WITNESS: Yes, sir.

MR. SALOTTOLO: Now, the question was, when you made your record observation at 1850 local time, is it required that the RVR indicate what the maximum and minimum values would have been during that preceding ten-minute period?

THE WITNESS: Yes, sir.

MR. SALOTTOLO: On this chart here, the spike indicates -- where the chart exact value, it indicates it was below 6,000 feet; is that correct?

THE WITNESS: Yes, sir.

MR. SALOTTOLO: So that would have required

that the maximum-minimum be in that observation, in the remarks to that observation?

THE WITNESS: Again, I believe it's supposed to be for a ten-minute period. It must stay down for ten minutes before a special is required.

MR. SALOTTOLO: So even though it went down to some value less than 6,000 feet -- let's pick a value. Let's say 600 feet. It goes down to 600 feet, back up to 6,000 feet. In the preceding ten-minute period, it doesn't require that that information be posted on the surface observation?

THE WITNESS: If it was for ten minutes, yes.

MR. SALOTTOLO: So it has to be maintained for ten minutes?

THE WITNESS: Yes, sir.

MR. SALOTTOLO: I'm still a little confused here. Under 2400 feet, it has to be -- it has to occur for ten minutes in order to result in a special?

THE WITNESS: Yes, sir.

MR. SALOTTOLO: What you're saying as far as looking at this graph or transmittance, even though the transmittance and the RVR decreased to some low value during the preceding ten-minute period preceding 1850

local, it didn't require a remark indicating the maximum or minimum RVR during that period?

THE WITNESS: At the time I was taking the observation, the best I can relate, certain times of the day they do change from the night scale to the day scale. Being extremely busy at the time, I took that at one of these locations.

MR. SALOTTOLO: So you didn't interpret this as being a weather phenomenon; you interpreted this as being some sort of maintenance function?

THE WITNESS: Yes, sir.

MR. SALOTTOLO: And that's the reason it didn't appear on the -- as a maximum and minimum on your 1850 local observation?

THE WITNESS: Yes, sir.

MR. SALOTTOLO: Could you refer to 5-B, page 12 and 13, please? Do you have it?

THE WITNESS: Yes, sir.

MR. SALOTTOLO: Could you identify that document, please?

THE WITNESS: That is a copy of the AWIS read-out that is on the -- I type in. That goes to the air traffic control and some of the airline users.

This is the information we send to them.

MR. SALOTTOLO: So the information on this document is similar or the same as the information on the surface weather observation form?

THE WITNESS: Yes, sir.

MR. SALOTTOLO: And the times this information was disseminated to the tower or -- well, let's look at page 12. It says sending. You look at the top, about a fifth of the way down?

THE WITNESS: Yes, sir.

MR. SALOTTOLO: It says, 2150 Z?

THE WITNESS: Yes, sir.

MR. SALOTTOLO: And that's the time it was sent or disseminated to the tower?

THE WITNESS: Yes, sir.

MR. SALOTTOLO: Now, 2150 Z is what in local time?

THE WITNESS: I believe it's 1650, I believe, local time.

MR. SALOTTOLO: It's 1650 eastern standard time?

THE WITNESS: I believe so.

MR. SALOTTOLO: Which is 1750 eastern

daylight time.

THE WITNESS: Right.

MR. SALOTTOLO: Now, the 1836 local time observation was disseminated at 1836 local time, according to this document.

THE WITNESS: Yes, sir. They have 2236, but it converts up to 0.

MR. SALOTTOLO: And the 1840 special observation was disseminated at 1840 local time or 2240 Z?

THE WITNESS: That was sent at 2241 Z.

MR. SALOTTOLO: Thank you. It's 2241 Z. And then finally looking at page 14, the 20 -- the 19 -- 1850 local observation was disseminated at 1851 local time?

THE WITNESS: Yes, sir.

MR. SALOTTOLO: Mr. Welch, could you turn to page 8, please?

THE WITNESS: I have it.

MR. SALOTTOLO: Could you identify that document, please?

THE WITNESS: That's a print-out of the MAPSOL observations for the complete day.

MR. SALOTTOLO: And these observations are identical to the observations or the same as the observations on the surface weather observation form?

THE WITNESS: Yes, sir.

MR. SALOTTOLO: Now, the times of dissemination, are they located at the end of each observation?

THE WITNESS: Yes, sir.

MR. SALOTTOLO: So it's 16 -- again, we're talking -- let's keep that local time. It's 1750 local time, the dissemination on long-line was at 1752?

THE WITNESS: No. The 1750 ob, you mean?

MR. SALOTTOLO: Yes, the 1751 observation was disseminated at 1752.

THE WITNESS: That's correct, sir.

MR. SALOTTOLO: And the next one, which was 1836 was disseminated at 1837?

THE WITNESS: That's correct.

MR. SALOTTOLO: And the 1840 observation was disseminated at 1842?

THE WITNESS: Correct.

MR. SALOTTOLO: On this dissemination, you had stated that you disseminated locally first -- I'm

sorry. You disseminated long line first and then locally. Is there any reason that's done as opposed to disseminating it locally and then long line?

THE WITNESS: Quality control of the observation, sir.

MR. SALOTTOLO: Could you just explain a little bit what you mean by that?

THE WITNESS: After we -- we'll type usually point of observation. We will come down and by looking at the observer console, we can see what the temperature is, the dew point, the wind direction and speed and the altimeter setting. We then enter this information into the computer MAPSOL program, which runs a quality check on that observation and then sends it out long line.

MR. SALOTTOLO: Is this a National Weather Service procedure; is it a local procedure; is it both? Do you know?

THE WITNESS: It's local policy.

MR. SALOTTOLO: Local policy. Other than the quality control, is there any reasons it couldn't be done the other way: locally first, long lined after local dissemination?

THE WITNESS: The quality control and the checking of the observation would make it susceptible to errors if we did it the other way.

MR. SALOTTOLO: Now, looking at the data, the AWIS data, the local -- record of the local observations and dissemination and long line dissemination, if you read the times, you can see that the dissemination locally was a minute or two before dissemination long line. Do you have any reason for that?

THE WITNESS: We have a station clock, which we get a reading from Boulder, Colorado at least three times a day that we go by the station clock in the observer console. We then go to the MAPSOL computer and that time is generally the same.

Now, we're also -- each hour, it has a little beeper that alerts us to the observation time. That is another check to show that the time is correct into MAPSOL.

We then enter the information into the AWIS system. That internal clock in the local AWIS system has been known to be off several times. There just isn't enough time really to stop, find the information

and to correct that time each time. That's why we enter the time at the beginning of every observation that we send out.

MR. SALOTTOLO: Now, to the best of your knowledge, the station clock was accurate?

THE WITNESS: Yes, sir.

MR. SALOTTOLO: And the MAPSOL clock was accurate?

THE WITNESS: Yes, sir.

MR. SALOTTOLO: But the AWIS clock or the AWIS time stamp may have been in error?

THE WITNESS: Yes, sir.

MR. SALOTTOLO: Do you know what the magnitude of that error might have been?

THE WITNESS: I don't understand your question.

MR. SALOTTOLO: Was it off by a couple of minutes, fast or slow?

THE WITNESS: It might have been a minute or so off.

MR. SALOTTOLO: When an observation is transmitted, disseminated locally to the tower, is there any way that you know, in fact, the tower has

received the information?

THE WITNESS: Generally if we do not have any response on the AWIS system saying they did not receive the information, we assume that they received the information. At the times that they do not get the information or what we believe they may not have the information, we have a remark asking us in so many terms if we want to resend.

Over the past few months prior to this accident and after the accident, there have been remarks on the AWIS system showing that certain stations connected to this system had not received the weather information. But, in checking with the tower, they had. So it's an erroneous reading that we just almost ignore sometimes.

MR. SALOTTOLO: I guess our concern is that if a special observation is made and disseminated, is there any way to make sure, in fact, the tower gets that special information?

THE WITNESS: It's generally assumed they have the information unless they call us or we send it again, whatever.

MR. SALOTTOLO: So you would have no way of

knowing if it even in fact made it to the tower?

THE WITNESS: We assume that it has unless we get a remark.

MR. SALOTTOLO: What other information is disseminated locally on AWIS?

THE WITNESS: If we have severe weather within 50 miles of Charlotte, we put out all warnings, whether it may be tornado or severe thunderstorm or flash flood, on the AWIS system to let tower and also the other aviation subscribers on the AWIS system know.

MR. SALOTTOLO: Now, where do these warnings come from?

THE WITNESS: We issue them, sir.

MR. SALOTTOLO: And these are public issuances?

THE WITNESS: Yes, sir.

MR. SALOTTOLO: What time did the thunderstorm begin at the field?

THE WITNESS: I couldn't say the correct time, but I believe it was just before 36, the observation before 36.

MR. SALOTTOLO: I'd like to ask you a couple of questions regarding the thunderstorm. First of all,

where was the location?

THE WITNESS: As far as I could tell, when it started, it was almost directly over the weather office somewhat to the north and extending north.

MR. SALOTTOLO: Could you determine any kind of movement?

THE WITNESS: Not right at the beginning. It looked like it was -- well, it may have been drifting slowly northward, but I couldn't say for sure.

MR. SALOTTOLO: And the amount of lightning that you observed?

THE WITNESS: There was a few ground -- I'm sorry. A few cloud to ground strikes.

MR. SALOTTOLO: And the winds during the thunderstorm, during the period of the thunderstorm, was there anything remarkable that you observed regarding the winds?

THE WITNESS: No, sir.

MR. SALOTTOLO: So the winds were less than 20 knots, 25 knots?

THE WITNESS: I believe so.

MR. SALOTTOLO: Now, the wind sensor for the Weather Service is located where?

THE WITNESS: It's approximately 300 feet to the northwest of the weather office just beyond the fence on the airport grounds.

MR. SALOTTOLO: And it's located 20 feet or so above the ground?

THE WITNESS: Yes, sir.

MR. SALOTTOLO: This particular thunderstorm, was there anything unusual about it?

THE WITNESS: If it was another situation and not this airplane crash, no, sir.

MR. SALOTTOLO: The visibility, the prevailing visibility of one mile you reported, was that uniform in all directions or was there more restrictions in certain quadrants?

THE WITNESS: I would say it was uniform in all directions.

MR. SALOTTOLO: Is there a local warning radar at Charlotte?

THE WITNESS: Yes, sir.

MR. SALOTTOLO: And is that a Douglas R-74-C?

THE WITNESS: Yes, sir.

MR. SALOTTOLO: What is that used for?

THE WITNESS: Local use only.

MR. SALOTTOLO: When you say local use only, can you just kind of expand a little bit on that?

THE WITNESS: We use it to help us to issue warnings or to compose statements. The only time we are really required to use it is when the network radar in Bristol, Tennessee is down for some mechanical reason or whatever. Then only if precipitation in the form of showers or thunderstorms occur in the northwest quadrant from Charlotte up towards Bristol. Any other precipitation in other areas we are not required to make a radar report.

MR. SALOTTOLO: So is it correct to say that this particular weather radar is used for public forecasting, issuing public warnings?

THE WITNESS: Yes, sir.

MR. SALOTTOLO: So you wouldn't use it at all for any aviation type of advisory?

THE WITNESS: We do not issue advisories, aviation advisories.

MR. SALOTTOLO: So you wouldn't use it in any other fashion, other than to generate a public warning? It wouldn't be used in aviation at all?

THE WITNESS: There have been times I have

seen echoes or thunderstorms on the radar that have not been of the criteria. And I've alerted the tower just on the hotline from the weather office to tower. But, generally, no.

MR. SALOTTOLO: So it's left up to the discretion of the specialist?

THE WITNESS: Yes, sir.

MR. SALOTTOLO: Did you use the radar during the period 1700 to 2000 local time, eastern daylight time?

THE WITNESS: Yes, sir.

MR. SALOTTOLO: What did you observe when you were reviewing the radar?

THE WITNESS: Most local warning radar have what they call a ground clutter pattern. And what that does is block out any storms that are within a certain area, especially this ground clutter patent. Outside of that area, I observed other showers and thunderstorms.

But between the time of 4:00 when I entered on duty to 6:00, all of the showers and thunderstorms were decreasing in coverage and in intensity. And there wasn't too many around at that time of the

accident.

MR. SALOTTOLO: Did you make a weather radar observation at 1930 local time?

THE WITNESS: Yes, sir.

MR. SALOTTOLO: Could you just kind of briefly describe what that was showing? You can refer to Exhibit 5-A, attachment 26 and 27.

THE WITNESS: Looking at attachment 26 -- and this is taken in -- it takes from the center of the display going out 125 miles. At that time, I had several cells just to the north of Charlotte; some to the south of Charlotte near Columbia, South Carolina, even though it's not listed; a shower between us an Asheville, North Carolina; and some to the north, probably just north of Greensboro.

In coding that observation, I determined it covered about two-tenths of the area.

MR. SALOTTOLO: Now, do you have any idea what the tops of this particular echo were?

THE WITNESS: Which one are you talking about, sir?

MR. SALOTTOLO: The one just north of Charlotte?

THE WITNESS: No, sir, I do not. In our observation, we pick out the highest top of that area. And at that time, the highest top to that two-tenths area was to the south of us. And that was at 28,000 feet.

MR. SALOTTOLO: The lightning you observed, could you give us a location of where the lightning was?

THE WITNESS: It was very -- at first, the first one I saw was very close to the weather office between us and the tower.

MR. SALOTTOLO: During the evening of July 2, 1994, did you receive any reports of severe weather?

THE WITNESS: I do not recall any, sir, no.

MR. SALOTTOLO: Was there an alarm feature on that radar?

THE WITNESS: No, sir.

MR. SALOTTOLO: Do you know what the intensity of the thunderstorm that you -- that was over the field?

THE WITNESS: No, sir.

MR. SALOTTOLO: Could you refer to Exhibit 5-A, attachment 4 and 5, please?

THE WITNESS: Okay.

MR. SALOTTOLO: Turn to attachment 5. That's the graphic transmittance for runway 36 left; is that correct?

THE WITNESS: That's correct, sir.

MR. SALOTTOLO: Now, focussing on that spike again between 1740 and 1745 standard time or 1840-1845 local time, you had testified earlier that you mistook that for some type of maintenance annotation on the chart.

THE WITNESS: Yes, sir. Generally when they switch from daylight -- I'm sorry -- from daytime to nighttime, they have remarks similar to this.

MR. SALOTTOLO: Well, my question is how often have you seen such a spike in the RVR trace in your career as a weather service specialist?

THE WITNESS: This has probably been the first time.

MR. SALOTTOLO: First time. Can you offer any explanation as to what you think might have caused the spike in this particular instance?

THE WITNESS: I would probably say the heavy rain.

MR. SALOTTOLO: Now, you weren't reporting any fog at the time; is that correct?

THE WITNESS: I was reporting haze.

MR. SALOTTOLO: Now, the contacts with the tower, there was -- how many contacts did you have with the tower during that afternoon and evening?

THE WITNESS: I don't recall the exact number. There was several.

MR. SALOTTOLO: Do you recall -- I think you testified that there was one contact involving visibility.

THE WITNESS: To the best of my recollection, I believe they called me when it dropped from six miles down to one mile. Then I may have called them when it improved from one mile up to mist. I believe it was made back to six miles. I'm not quite sure.

MR. SALOTTOLO: But that would have been subsequent to the accident.

THE WITNESS: Yes.

MR. SALOTTOLO: Did you provide advisories or any other information to the tower during the period 1800 to 1900 local time?

THE WITNESS: Only the observation, sir.

MR. SALOTTOLO: But this was done over AWIS.

THE WITNESS: Yes, sir.

MR. SALOTTOLO: And the phonecalls indicating visibility increase one mile and six miles.

THE WITNESS: Yes, sir.

MR. SALOTTOLO: During the afternoon and evening, did you have contact with any other personnel at the weather service unit forecast office?

THE WITNESS: I had contact with the forecast office in Raleigh, North Carolina.

MR. SALOTTOLO: Nobody at the center weather service unit in Atlanta?

THE WITNESS: No, sir, we do not contact them.

MR. SALOTTOLO: Any other national weather service or FAA personnel?

THE WITNESS: I had on two occasions contacted at the tower to find out definite there was an accident on the field.

MR. SALOTTOLO: Do you -- if a special observation is sent to the tower on AWIS, how would the tower know that it was a special observation?

THE WITNESS: We have the code "SP." That

stands for special observations. Regular observations would be "SA." A record special observation would be "RS."

MR. SALOTTOLO: Okay. And I think you probably answered this, but there is really no way to -- you send a special to determine in fact the tower has that information? In other words, you send it, but you're not sure where it winds up essentially?

THE WITNESS: Well, I do know it does go to the tower. And I'm quite sure it goes to the several airlines at the airport. But if exactly they receive it, sometimes there's a question on that. And if they do not receive it, they give us a call. On occasions, they have given us a call and asked for the observation.

MR. SALOTTOLO: I could see with record observations that are scheduled every hour. But with special observations, how would they know if they didn't receive it if they don't know a special can be issued?

THE WITNESS: I guess there would be no way of knowing if we didn't get a remark back. But if we don't get any remark back on the AWIS system, then we

assume they have it.

MR. SALOTTOLO: During the afternoon and evening of July 2, 1994, was all of the equipment operating normally?

THE WITNESS: Yes, sir.

MR. SALOTTOLO: Thank you, Mr. Welch. I have no further questions at this time.

CHAIRMAN HAMMERSCHMIDT: Thank you, Mr. Salottolo. A quick question for the record. Where is the weather service office located at the airport?

THE WITNESS: We are approximately to the southeast of Charlotte control tower.

CHAIRMAN HAMMERSCHMIDT: Thank you. Let's see. Going to the parties' questioning, Mr. Donner.

MR. DONNER: Thank you, sir. We have no questions.

CHAIRMAN HAMMERSCHMIDT: National Air Traffic Controllers Association.

MR. PARHAM: Mr. Welch, did you ever call the tower and request a visibility check?

THE WITNESS: Yes, sir.

MR. PARHAM: Why would you do this?

THE WITNESS: If I thought at surface the

visibility was reduced or it increased from a certain figure. Generally when the visibility reduces to four miles or less, the tower takes control of visibility. When it increases to above four miles, the weather service takes the responsibility. If any time between that time, if either one of us believes that it's either lower or higher, we may call -- or they may call me on the hotline.

MR. PARHAM: What position at the tower do you talk to when you make these calls back and forth?

THE WITNESS: I believe it's the cab of the air traffic control up at the top.

MR. PARHAM: Do you know what position you actually talk to?

THE WITNESS: No, sir.

MR. PARHAM: Is the time stated for the observation that you put on the observation the time you begin taking the observation or the time when you complete all evolutions involved in observation itself?

THE WITNESS: That time is the time we observe the last element in the observation, and that is generally the wind.

MR. PARHAM: All right. Would you call the

tower and advise them of the visibility dropping before or after you take the observation?

THE WITNESS: I would say before, so that we would have the observation correct.

MR. PARHAM: After you take the observation, how long does it take for you to comprise this observation and put it on the list?

THE WITNESS: It varies in time, but I would say no more than two minutes.

MR. PARHAM: Is there any lag time in the transmission over the AWIS?

THE WITNESS: I couldn't say, sir.

MR. PARHAM: I have no further questions, Mr. Chairman.

CHAIRMAN HAMMERSCHMIDT: Thank you. Honeywell.

MR. THOMAS: Thank you, Mr. Chairman. We have no questions.

CHAIRMAN HAMMERSCHMIDT: Thank you. Airline Pilots Association.

MR. TULLY: Thank you. You stated you were the only weather observer on duty at the time of this event; is that correct?

THE WITNESS: Yes, sir.

MR. TULLY: Is that the standard manning at a National Weather Service station at an airport the size of Charlotte?

THE WITNESS: Yes, sir -- for huge Charlotte, yes.

MR. TULLY: You state that part of your responsibility as the observer is to issue public alerts regarding severe weather, such as severe thunderstorms, tornadoes, et cetera?

THE WITNESS: Yes, sir.

MR. TULLY: Is the WSR-74-C radar one of those tools which you used in creating those alerts?

THE WITNESS: That's one of the tools, yes.

MR. TULLY: Was it your observation that the severe storm that was over the field at the time of this event was in the ground clutter pattern for that radar?

THE WITNESS: I'm not sure what you mean by severe storm. Our criteria on severe storm may differ from yours.

MR. TULLY: Okay. Let me rephrase the question. The thunderstorm which you had observed over

the field, was it in the ground clutter pattern of the WSR-74-C radar at your station?

THE WITNESS: Yes, sir.

MR. TULLY: Do you have any alternative tools to characterize the strength of storms over the airport since when they are in the ground clutter, they cannot be seen?

THE WITNESS: Personal experience when the amount of lightning, the amount of wind, generally a severe thunderstorm, when we reach winds of 58 miles or more, or dime-size hale or larger, that did not occur.

MR. TULLY: So if it were -- let's just take the case where the storms are outside of the ground clutter. Does this radar incorporate a VO integration processor? Can you determine the VIP levels of storms directly from the radar?

THE WITNESS: By stopping the rotation of the antennae and looking at it, yes.

MR. TULLY: Do you have access to the WSR 88-D radar at Columbia?

THE WITNESS: No, sir.

MR. TULLY: Could you contact them by land line for an observation?

THE WITNESS: Yes, sir.

MR. TULLY: So that would be available if you wanted to know what the level of a storm was over the airport, for instance?

THE WITNESS: Yes, sir.

MR. TULLY: Do you have any equipment a the weather station which can detect or measure directly a weather phenomenon known as micro verse?

THE WITNESS: No, sir.

MR. TULLY: We have no more questions for this witness.

CHAIRMAN HAMMERSCHMIDT: Thank you, Captain Tully. USAir.

MR. SHARP: We have no questions.

CHAIRMAN HAMMERSCHMIDT: Thank you. McDonnell-Douglas.

MR. LUND: No questions, Mr. Chairman.

CHAIRMAN HAMMERSCHMIDT: Thank you. Let's see. I don't believe Mr. Goglia has arrived, yet. The Association of Flight Attendants.

MS. GILMER: I have no questions. Thank you.

CHAIRMAN HAMMERSCHMIDT: Pratt and Whitney.

MR. YOUNG: No questions. Thank you.

CHAIRMAN HAMMERSCHMIDT: Dispatchers Union.

MR. SCHUETZ: Mr. Welch, you say it takes about two minutes from the time you end reporting your weather to the time you transmit it; is that correct?

THE WITNESS: Roughly, it can be give or take some time, but roughly no more than two minutes.

MR. SCHUETZ: How long does it take you to take a weather observation?

THE WITNESS: To observe it correctly, it means going up to the roof of the weather office, looking at all quadrants, seeing what type of clouds we have, what precipitation in the form of snow, rain or whatever is falling, how far we can see them coming down visibly from the top of the roof into the weather office and observing the temperature gauges, the altimeter gauges and wind gauges, and then entering that into the MAPSOL observing computer.

MR. SCHUETZ: How long you figure that takes, about two minutes, three minutes?

THE WITNESS: It varies on the weather, sir.

MR. SCHUETZ: So, conceivably, from the time you take the first observation and visibility, it could be four to five minutes before it gets to the tower; is

that correct?

THE WITNESS: From the last entry of the observation that we observe to the transmission, it probably does not take no more than a minute. To observe all of the things going up on the roof, observing what is going on, takes longer, yes.

MR. SCHUETZ: So there could be a time lag of two to three minutes from the actual -- from when you take visibility measurements and send it to the tower, there could be two to three, maybe four, minutes differences.

THE WITNESS: Yes.

MR. SCHUETZ: Thank you very much.

CHAIRMAN HAMMERSCHMIDT: Thank you. National Weather Service.

MR. KUESSNER: I have several follow-up questions, some from ALPA. Regarding the thunderstorm that you observed physically when you went outside, did that thunderstorm exhibit any severe weather characteristics?

THE WITNESS: No, sir.

MR. KUESSNER: Based on what you observed, was there any reason for you to call the 88-D facility

at Columbia?

THE WITNESS: No, sir.

MR. KUESSNER: With respect to the last line of questioning, the observation, I just want to make sure this is clear now. When you're talking about four to five minutes, that span, that is from the time you begin your observation -- from the time you go up on the roof to the time it gets to the tower. Is that what you mean by the four to five minutes?

THE WITNESS: Yes, sir.

MR. KUESSNER: But actually after you complete the observation, from that time until it gets to the tower, you stated -- I want to make sure I got this accurately, it was anywhere from one to two minutes?

THE WITNESS: From the time I actually finished observing all of the elements and observing the wind, from that point on to entering it into the MAPSOL computer system, that takes probably about a minute or less. Then the time I take it from MAPSOL and send it up to the tower through AWIS, probably another 30 to 45 seconds.

MR. KUESSNER: Thank you. No further

questions.

CHAIRMAN HAMMERSCHMIDT: Any more questions from the technical panel?

(No response.)

CHAIRMAN HAMMERSCHMIDT: Mr. Laynor.

MR. LAYNOR: Mr. Welch, exactly where is the WSR-74-C?

THE WITNESS: It's located just off the operation area of the weather office.

MR. LAYNOR: About a mile southeast of the tower?

THE WITNESS: No. It's right at the weather office, sir. It's in the same room. It's just another room off the operations area.

MR. LAYNOR: Okay. Where is that on the airport?

THE WITNESS: About a mile southeast of the tower.

MR. LAYNOR: And about what radius does the ground clutter area cover?

THE WITNESS: It varies in atmospheric conditions. Generally in the summer, it's a lot -- I don't know exact miles, but it's a lot bigger than when

you have an area too high pressured. During the winter, it's a lot smaller. The actual miles in the direction, I couldn't say.

MR. LAYNOR: But it's not -- that radar is not useful at all for seeing weather right over the airport?

THE WITNESS: Yes, it's not useful at all.

MR. LAYNOR: Just for clarification, in your reporting for public alerting, what criteria would you use to report severe storms based on the WSR-74-C?

THE WITNESS: If we saw a storm on the WSR-74-C radar in excess of 50,000 feet high and with the five level core at 26,000 feet or higher, that would be the requirements for issuing a severe thunderstorm warning.

MR. LAYNOR: So you do have VIP levels on the 74-C?

THE WITNESS: Yes, sir.

MR. LAYNOR: And in responding to Mr. Kuessner, you said that you didn't see anything that would meet your criteria for a severe thunderstorm over the airport on the evening of the event. Did I understand you correctly?

THE WITNESS: Yes, sir, it didn't seem threatening at all.

MR. LAYNOR: What would seem threatening; did you see lightning?

THE WITNESS: Yes, sir.

MR. LAYNOR: Would lightning cause you to have concern sufficient to go a little further to find out what the level of the conductive activity is?

THE WITNESS: It would have me concerned. But in observing the weather for two hours prior to the accident, the feeling and sense I got was that the activity was decreasing both in coverage and intensity. In past experience, in looking at that storm, compared to the storms that we hit on the Psalm Sunday, that did not seem threatening at all.

MR. LAYNOR: You would look at the wind velocity as a primary factor there?

THE WITNESS: That would be one of them, yes.

MR. LAYNOR: Do you have rainfall rate, also?

THE WITNESS: The rainfall was not a criteria for severe weather.

MR. LAYNOR: All right. Thank you, Mr. Welch.

CHAIRMAN HAMMERSCHMIDT: Thank you, Mr. Laynor. Mr. Clark.

MR. CLARK: No questions.

CHAIRMAN HAMMERSCHMIDT: Mr. Schleede.

MR. SCHLEEDE: No questions.

CHAIRMAN HAMMERSCHMIDT: Thank you very much, Mr. Welch, for your testimony and your cooperation. Let me ask you before you stand down, is there anything that you would like to add for the public record?

THE WITNESS: No, sir.

CHAIRMAN HAMMERSCHMIDT: Thank you again.

(Witness excused.)

CHAIRMAN HAMMERSCHMIDT: Let's see. The time is 1:20, and I had indicated that I would try to take a break about every hour and a half. So I believe we'll take our first break after the first two witnesses. We will reconvene in 10 minutes. Thank you.

(Brief recess.)

CHAIRMAN HAMMERSCHMIDT: Let's please get started again. Let's see.

Witness number 2 is Mr. Arthur Ayers. Would you please come forward?

Mr. Ayers will be questioned by Mr. Salottolo.

Excuse me. Mr. Ayers, did I pronounce your name correctly?

MR. AYERS: Ayers, yes, sir.

ARTHUR AYERS, NWS - ATLANTA ARTCC CENTER
WEATHER SERVICE UNIT, ATLANTA, GEORGIA

Whereupon,

ARTHUR AYERS,

having been first duly sworn was called as a witness herein and testified as follows:

MR. SCHLEEDE: Mr. Ayers, would you give us your full name and business address for our record?

THE WITNESS: My name is Arthur W. Ayers, Jr. I'm the meteorologist in charge of the Center Weather Service unit located near the traffic control center in Hampton, Georgia.

MR. SCHLEEDE: And you're employed by?

THE WITNESS: The National Weather Service.

MR. SCHLEEDE: What position do you hold there?

THE WITNESS: Meteorologist in Charge.

MR. SCHLEEDE: Would you give us a brief description of your experience and education that qualifies you for your current position?

THE WITNESS: I graduated from Florida State University with a bachelor or science degree in

meteorology in 1964. I worked in a weather service office in the state of West Virginia for six years as a combination pilot briefer/observer/public service person.

In 1970, I transferred to what was an aviation forecast unit in the forecast office in Cleveland, Ohio. I worked there for a year.

In 1971, I transferred to the forecast office in Portland, Maine, where I was a combination public and aviation forecaster.

In 1978, I transferred to the Center Weather Service unit in the Atlanta air traffic control center; and was promoted to Meteorologist in Charge in 1982. I've held that position since that time. So it's a total of about 30 years of National Weather Service experience.

MR. SCHLEEDE: Thank you. Do you hold any FAA ratings or certificates?

THE WITNESS: No, sir.

MR. SCHLEEDE: Mr. Salottolo will continue. Thank you.

MR. SALOTTOLO: Thank you, Mr. Schleede. Mr. Schleede, can you provide the witness with Exhibit 5-C,

please?

MR. SCHLEEDE: He has it.

MR. SALOTTOLO: Mr. Ayers, can you hear me okay?

THE WITNESS: Yes, sir.

MR. SALOTTOLO: Mr. Ayers, what shift did you work on July 2, 1994?

THE WITNESS: It was 1400 local time to 2200 local time. That would be 1800 UTC Greenwich mean time to 0200 UTC. That's basically my term of reference, is UTC Greenwich mean time.

MR. SALOTTOLO: To go from UTC to local time, you subtract four hours.

THE WITNESS: Four hours, that's correct.

MR. SALOTTOLO: Okay.

THE WITNESS: When you're on daylight time.

MR. SALOTTOLO: Daylight time. Can you briefly describe your duties and responsibilities as MIC, Meteorologist in Charge, in Atlanta?

THE WITNESS: Well, I supervise the unit of operation. Our basic responsibility is to provide meteorological consultation and advice to the FAA located that Atlanta air traffic control center, plus

15 tower facilities located in some six states -- portions of six states and the southeastern United States; roughly covering an area of 103,000 square miles. We are also occasionally involved with providing some information to the flight service stations in the same six-state area.

MR. SALOTTOLO: Now, were you the only one on shift during this period?

THE WITNESS: We have an overlap of one-half hour.

MR. SALOTTOLO: Could you just briefly describe what transpired during that half hour overlap period?

THE WITNESS: You receive a briefing from the forecaster who has been on duty. He gives you his analysis of what's happening meteorologically across the air space. He points out any problems which he thinks may develop. That's basically it. So with a half hour of overlap there, you may continue after he's -- we've had this brief shift briefing discussion. He may continue on with a few duties while I study on my own information which is available to me.

MR. SALOTTOLO: Is this normal staffing for

the CWSU?

THE WITNESS: Yes, sir, it is.

MR. SALOTTOLO: Would you turn to Exhibit 5-C, page 4 and 5? We'll start with page 4.

THE WITNESS: Yes, sir.

MR. SALOTTOLO: Could you identify pages 4 and 5?

THE WITNESS: Page 4 is a copy of a facsimile which was sent to Bill Kneas at National Transportation Safety Board. It's a cover sheet. And page 5 is a copy of a weather bulletin, which was disseminated to Atlanta Tower and Charlotte Tower at 1920 UTC on July 2.

MR. SALOTTOLO: And this was -- this is a fax that is disseminated on a -- is there a special line it's sent on?

THE WITNESS: That's correct. A facsimile line. We have a connection to both the Atlanta tower and the Charlotte tower.

MR. SALOTTOLO: So it's like a hotline. It's not an outside dial line that you would send this on?

THE WITNESS: It's a facsimile machine. You insert the paper into the facsimile machine. I hit a

button. It's automatically dialed. Charlotte tower transmits. When that transmission is complete, I reinsert the bulletin in the facsimile machine. It transmits to the Atlanta tower.

MR. SALOTTOLO: You said Atlanta tower and Charlotte tower?

THE WITNESS: That's correct.

MR. SALOTTOLO: Could you just briefly describe what information this contains relative to -- in relation to the Charlotte tower?

THE WITNESS: Well, you see it's basically a weather map. The boundary of the air space is outlined with a somewhat jagged line falling across the six states there that are involved. That's basically a map of existing conditions.

Then we follow that up with a little synopsis of expected conditions. The synopsis, of course, describes areas of concern.

We follow it up with a generalized forecast for the two hub airport in Charlotte and Atlanta. We give them a little more information about potential for precipitation levels and intensity, et cetera, movement, tops; some information about freezing levels

and projections of potentials for icing and turbulence.

MR. SALOTTOLO: This information, you said, goes to the Charlotte tower?

THE WITNESS: That's correct. It goes to Charlotte and Atlanta tower.

MR. SALOTTOLO: Does it go to the approach control, do you know; or does it go to both places?

THE WITNESS: To my knowledge, the facsimile receiver on the other end is located somewhere in the TRACON at both airports.

MR. SALOTTOLO: On this document, it was indicating level 4 and 5 thunderstorms with tops to 45 to 50,000 feet.

THE WITNESS: That was the projection, yes, sir, forecast; diminishing after 010; isolated. The term "isolated" is indicated there, as well, which implies probably a very small percentage in air space.

MR. SALOTTOLO: This document goes to Atlanta and Charlotte?

THE WITNESS: Atlanta tower and Charlotte tower.

MR. SALOTTOLO: Charlotte tower. Well, why Atlanta and Charlotte as opposed to other airports in

the Atlanta's air space?

THE WITNESS: Well, the requirement was established by the FAA. They requested that we provide this information to our larger airports. So we provide this information to them.

MR. SALOTTOLO: Could you turn to page 6, please? Could you identify that?

THE WITNESS: That's a meteorological impact statement, which was issued at 1335 UTC, the morning of July 2nd. It was issued by my predecessor, Dean Hussel. And it basically is what we refer to a meteorological impact statement. It provides the information for planning purposes across Atlanta center's air space. We once again outline areas of concern.

In this case, we indicated a potential for widely scattered thunderstorms. And there was also widely scattered thunderstorms across the entire air space. And there was also some concern for some higher altitude turbulence over the northern half of the air space.

MR. SALOTTOLO: Now, this meteorological impact statement covered the time of the classified?

THE WITNESS: Yes, sir. It's effective from -- as you see there at the top, the time is clearly outlined for a period of 12 hours from 1335 UTC on the 2nd to 0135 on the 3rd.

MR. SALOTTOLO: What kind of dissemination does this product get?

THE WITNESS: When we compile the meteorological impact statement, it is entered into a computer system referred to as the lead service A system. This connects us with a computer at Kansas City, Missouri. That computer feeds this information back to flight service stations. It goes to other air traffic control centers.

The computer is also linked to a computer up in Washington, which disseminates the information through the National Weather Service. It makes it available to the private sector, as well.

MR. SALOTTOLO: And this gets to Charlotte. Is this disseminated to the FAA facilities at Charlotte?

THE WITNESS: Yes, sir. It's disseminated to all towers in our air space.

MR. SALOTTOLO: Now, you say this is a

planning document.

THE WITNESS: Yes, sir.

MR. SALOTTOLO: What do you mean; it's not an advisory?

THE WITNESS: No, sir.

MR. SALOTTOLO: What do you mean by that?

THE WITNESS: It's a planning forecast. It's basically an outlook of potential for development during the time frame, which, in this case, was 12 hours.

MR. SALOTTOLO: Whose planning is it intended?

THE WITNESS: The FAA's planning.

MR. SALOTTOLO: Mr. Ayers, could you turn to page 8, please?

Could you identify that document?

THE WITNESS: This is our facility for July 2, 1994.

MR. SALOTTOLO: What normally appears on the facility log?

THE WITNESS: Activities that the forecaster is engaged in during his operational shift.

MR. SALOTTOLO: What I would like to do is go

over some of these activities. Let's start with 1808 UTC, which is 1408 local time, eastern daylight time. Kind of explain what is showing on the document there.

THE WITNESS: Well, at this time, Mr. Hussel was still on duty. And at that time, he briefed the Charlotte tower on some weather which he noted, indicating 3 and 4 level intensity, going 15 miles east of the Charlotte airport.

MR. SALOTTOLO: Now, is there a written requirement that when level 3 and 4 cells are building east to the Charlotte airport that you notify the tower?

THE WITNESS: No.

MR. SALOTTOLO: So it's left up to the discretion of the forecaster?

THE WITNESS: Yes, sir.

MR. SALOTTOLO: How about the -- it looks like 1810.

THE WITNESS: At 1810?

MR. SALOTTOLO: Yes.

THE WITNESS: It indicates that, once again, Mr. Hussel briefed area 1 and area 2. The center is broken down into areas of specialization. We have

seven areas. And in this case, he talked to center personnel, areas 1 and 2 supervisors about the cell east of Charlotte; and briefed on levels 3's and 4's situated north of the parts on VOR. And scattered north were isolated cells apparently, northward toward the Lynch, Virginia area.

MR. SALOTTOLO: Okay. At 1850 --

THE WITNESS: I have a correction. It should be the Lynchburg, Virginia area.

MR. SALOTTOLO: Now, the 1850 Z entry is your entry?

THE WITNESS: That's correct.

MR. SALOTTOLO: Could you just kind of explain briefly what that means?

THE WITNESS: I have a notation there, brief SE, which stands for system engineers, abbreviation shorthand. It's a requirement in the facility that we alert airways facility people to lightning when may impact one of the long-range radar sites situated around the Atlanta center's air space.

The same entry indicates that I spoke to Augusta TRACON about level 4. Correction. I spoke to Augusta TRACON and the area 4 supervisor within the

Atlanta center about level 4's with tops close to 40,000 feet in the area 4 area with specialization in the center. Also, there was apparently some impact there to Augusta TRACON.

I might add that on the day in question, in addition to the map, one of the things that was going to become a meteorological factor was tropical storm Alberta which was situated down in the Gulf of Mexico. And there may have been some possible fringe effect affecting the southern portions of our airspace on the 2nd of July.

As you know, that tropical storm in the state of Georgia and southern portions of Alabama was with historic flooding, et cetera.

MR. SALOTTOLO: The 1908 entry?

THE WITNESS: At that time, that would be our routine briefing. I briefed Charlotte TRACON to indicate that I'm -- have either faxed or about to fax the graphic weather bulletin to them; and verbally run down my expectations for impact in their air space for the ensuing hours of the shift; basically give them information that you'll find on the graphic weather bulletin.

I usually conclude the briefing with a discussion of what we see on the available radars.

MR. SALOTTOLO: Now, at 1921, you have -- was that weather warning 544 to the weather coordinator?

THE WITNESS: Yes, sir. That was given to the weather coordinator.

MR. SALOTTOLO: In the center, Atlanta center?

THE WITNESS: That's correct.

MR. SALOTTOLO: The 544, that was not pertinent to the North Carolina --

THE WITNESS: No. That was outside of Atlanta center's air space. There is a requirement that if the weather watch, the severe weather watch, touches a buffer of 150 miles outside of Atlanta center's air space, that they also need that information. Apparently that was the case here.

MR. SALOTTOLO: Now, you have an entry of 2010 Z.

THE WITNESS: The same procedure that applied to the Atlanta tower. We usually brief both of them about the same time, one before the other. We might talk to Charlotte first or Atlanta second. Basically

the same discussion took place there that took place with the Charlotte tower.

MR. SALOTTOLO: Without going through it line by line here, kind of summarize from, let's say, 2040 to about 2235, 2240, what you were doing that evening -- afternoon and evening?

THE WITNESS: Well, I was using various bits of information there. Our meteorologist weather processor, our principal user processor NEXRAD 4 station and the RRWDS radar system to net-watch weather developments across Atlanta center's air space.

And there were contacts made, for instance, during the time frame of Tuscaloosa tower, Birmingham TRACON; another contact with the Augusta TRACON; contacts with supervisors in the center about developments; contact with Birmingham TRACON about activity in their air space; contact with Montgomery TRACON about weather in their air space; contact with Columbus TRACON about weather developments in their air space.

Where did you want me to stop, sir?

MR. SALOTTOLO: Approximately about 2240.

THE WITNESS: Twenty-two forty, did you say?

MR. SALOTTOLO: Yeah, 2240, we'll get up to there in second here. Now, when you talk about -- I'm sorry. Go ahead.

THE WITNESS: I think I've got that far. Now, you say 2240?

MR. SALOTTOLO: Yeah.

THE WITNESS: Yeah. Okay. I stopped just about that point.

MR. SALOTTOLO: Now, when you say weather in the air space was mainly or exclusively thunderstorm activity?

THE WITNESS: Well, it's on that impact statement there was some concern about some high altitude turbulence as well in the northern portion air space. There was a concern for widely scattered or isolated thunderstorm development across the air space. A little more concern perhaps on the southern portion of the air space because of apparently fringe effects from tropical storm Alberta.

MR. SALOTTOLO: Now, these calls to these various tower and TRACONs, is that a requirement as the reason the calls were made?

THE WITNESS: No.

MR. SALOTTOLO: Or is it discretionary?

THE WITNESS: It's discretionary. We try to provide assistance to every tower in our air space as the opportunity permits.

MR. SALOTTOLO: So that's one of your jobs as a CWSU?

THE WITNESS: That's correct.

CHAIRMAN HAMMERSCHMIDT: About how many towers does that represent?

THE WITNESS: Fifteen.

CHAIRMAN HAMMERSCHMIDT: Fifty, five zero?

THE WITNESS: Fifteen, one five.

CHAIRMAN HAMMERSCHMIDT: One five. That's all of the towers in your air space?

THE WITNESS: I believe so. I could be missing perhaps a VFR tower like in Greenville, South Carolina. I don't know if that's included.

CHAIRMAN HAMMERSCHMIDT: Thank you.

MR. SALOTTOLO: Getting back to the facility operations log, page 8, the 2243 Z entry?

THE WITNESS: Yes.

MR. SALOTTOLO: Just kind of explain about that.

THE WITNESS: At the request of our air traffic management unit, I provided some information on levels of intensity of precipitation that I observed using two radars. I provided the information to the traffic management unit.

MR. SALOTTOLO: Now, which two radars did you use?

THE WITNESS: The National Weather Service WSR-57 located at Athens, Georgia and the Maiden airborne traffic control radar, long-range radar, located in Maiden, North Carolina.

MR. SALOTTOLO: So the Athens radar is a NWS radar dedicated to weather surveillance.

THE WITNESS: That's correct.

MR. SALOTTOLO: And the other one is just an FAA radar dedicated to air traffic.

THE WITNESS: Air traffic control.

MR. SALOTTOLO: Why did you brief the TMU at this time?

THE WITNESS: He indicated to me that he had some inquiries from the traffic management unit in Charlotte about thunderstorm development in the Charlotte area.

MR. SALOTTOLO: Now, the -- this traffic management individual, he's at the center?

THE WITNESS: That's correct.

MR. SALOTTOLO: Where in relation to the CWSU is he located?

THE WITNESS: Well, the -- it's approximately 30 feet from our location in the center.

MR. SALOTTOLO: So he just calls? I mean, is he verbally --

THE WITNESS: No. We have really an excellent -- excellent means of communication within the center. We have these hand-held radios. And you can call a specific supervisor or someone in the traffic management unit. It's kind of a party line. Other supervisors, of course, can hear the conversation. It's a very efficient and very excellent way of communicating within the center.

MR. SALOTTOLO: Now, 2253 Z, which is 1853 local time, can you just kind of explain that entry?

THE WITNESS: At that time I called the Charlotte TRACON and briefed them about the possible 3 level intensity echo on the northeast side of the Charlotte airport. We have a little circle on the

radar indicating approximately where there terminal is located. And this weather, like I said, just a little north of the center on the monitor.

MR. SALOTTOLO: At this time, which radar were you looking again?

THE WITNESS: Once again, I used both.

MR. SALOTTOLO: Both.

THE WITNESS: Both.

MR. SALOTTOLO: What prompted this -- is that a call?

THE WITNESS: I'm sorry?

MR. SALOTTOLO: You called on the phone?

THE WITNESS: I called?

MR. SALOTTOLO: Yeah.

THE WITNESS: Yes. Well, that was -- once again, net watching.

MR. SALOTTOLO: So there is nothing says if there is a level 3 or a level 1 or level 2, that it's a requirement that you call Charlotte; again, it's discretionary?

THE WITNESS: That's correct.

MR. SALOTTOLO: Other than the contacts we just spoke of, were there any contacts with the

Charlotte tower or TRACON on this day?

THE WITNESS: On my shift?

MR. SALOTTOLO: Yes.

THE WITNESS: Not that I'm aware of.

MR. SALOTTOLO: How about with any other National Weather Service offices?

THE WITNESS: On the day in question, no, not that I know of.

MR. SALOTTOLO: How about any other individuals in the center, Atlanta center, regarding the weather in the Charlotte area?

THE WITNESS: Other than, of course, the conversation with traffic management, again. We do perform a stand-up briefing as indicated here, which took place 2010 UTC; at which time all area supervisors attend and receive a weather briefing on developments across the entire air space.

MR. SALOTTOLO: So, other than those contacts, there were no other contacts with any FAA personnel in the center regarding Charlotte, weather in the Charlotte area?

THE WITNESS: That's correct.

MR. SALOTTOLO: Mr. Ayers, one of the

advisories the CWSU issues is a center weather advisory; is that correct?

THE WITNESS: That's correct.

MR. SALOTTOLO: Could you briefly describe what a center weather advisory is?

THE WITNESS: It's an advisory to advise flight crews, weather briefers to potential developments across Atlanta center's air space, which they impact for safe or efficient flow of aircraft.

MR. SALOTTOLO: Now, this is a written advisory?

THE WITNESS: That's correct.

MR. SALOTTOLO: Were any center weather advisories issued for the North Carolina area?

THE WITNESS: No, sir.

MR. SALOTTOLO: So they were not issued for Charlotte?

THE WITNESS: No, sir.

MR. SALOTTOLO: Under what conditions would you issue a center weather advisory for Charlotte?

THE WITNESS: Under the same conditions that I issue them for anywhere in the Atlanta center's air space.

MR. SALOTTOLO: Could you kind of explain what the criteria are then, please?

THE WITNESS: Well, number one, to redefine or elaborate on a SIG net, convector SIG net or air net issued by the National Aviation Weather Advisory Unit in Kansas City, Missouri.

Number two, when convector SIG net or air net criteria has been met, but a SIG net, convector SIG net or air net has not been issued by the National Aviation Weather Advisory Unit in Kansas City, yet.

And, thirdly, when convector SIG net, SIG net or air net criteria have not been met; but, in the forecaster judgement, using the available information, he determines that there may be some impact on the safe or efficient flow of aircraft.

MR. SALOTTOLO: And one of the weather conditions that can affect obviously the safe and efficient flow of air traffic are thunderstorms; is that correct?

THE WITNESS: That's correct.

MR. SALOTTOLO: So why wasn't a CWA issued for Charlotte in this particular thunderstorm?

THE WITNESS: Well, as you know, at the time

the accident occurred, I had an entry there to indicate that I was in the process of briefing the Columbus TRACON about some weather developments in the air space. It was a more organized area of weather. And it was using or principally using a processor, a NEXRAD processor to interrogate that weather. And that is where my attention was focused at that time.

MR. SALOTTOLO: Now, if your attention was focused on Charlotte --

THE WITNESS: It was not focussed -- it was not focussed on Charlotte. It was focused on Columbus.

MR. SALOTTOLO: Okay. But it was focused on Charlotte --

THE WITNESS: I'm sorry. I didn't hear that.

MR. SALOTTOLO: I said, if your attention was focussed on Charlotte at this time, would -- in your opinion, would a CWA have been necessary?

THE WITNESS: No, sir.

MR. SALOTTOLO: And the reason being?

THE WITNESS: Because in my judgement, the activity which I noted on the information which I had available and other -- I had no other information that indicated it met the criteria.

MR. SALOTTOLO: Now, if you had information on, let's say, a level 5 or level 6 cell, was at the airport, would a CWA -- I'm talking about any airport now.

THE WITNESS: That's right.

MR. SALOTTOLO: Would a CWA have been appropriate in that case?

THE WITNESS: It depends on the circumstances. There definitely would be some form of communication, either through the 300 telephone system, and probably a center weather advisory; particularly if there were some indications that that thunderstorm was a severe weather producer.

MR. SALOTTOLO: So at the very minimum, there would be some kind of verbal communication --

THE WITNESS: Absolutely.

MR. SALOTTOLO: -- effected?

THE WITNESS: Absolutely.

MR. SALOTTOLO: Now, what's your understanding as to what happens to a verbal communication from the center weather service unit?

THE WITNESS: Within Atlanta center or at the TRACON?

MR. SALOTTOLO: When you verbally communicate something to an airport TRACON, what's your understanding as to what happens after that communication?

THE WITNESS: I have no knowledge of that.

MR. SALOTTOLO: I'd like to go through briefly just the procedures in the issuance for CWA. You detect -- you determine the reason for issuance. Then you put it together. Then it's disseminated in some matter. Could you kind of go over step by step how that's done?

THE WITNESS: After we make a decision to issue a center weather advisory, we have to outline the area of concern, of course; describe it to the best of our ability; and make an entry into -- once again, into the lead service A system which disseminates this product to the FAA computer, the National Weather Service. It goes out to flight service stations, private -- the private sector has access to this information.

Then we hand carry a copy of the center weather advisory to the weather coordinator or the supervisor of the traffic management unit and provide

him with a hard copy of that center weather advisory.

MR. SALOTTOLO: How long does it take to get to that point approximately?

THE WITNESS: Well, dissemination through the terminal is you just hit the button as she goes. That's probably less than a minute. I would think that from the time that you make the entry into the lead service A system, certainly inside of five minutes, probably one or two minutes more likely. It's just a matter of walking 38 feet and handing the advisory to the supervisor or the weather coordinator.

MR. SALOTTOLO: Now, verbal issuances to airport approach controls, let's discuss how that information gets to the, let's say, TRACONs?

THE WITNESS: You say how does a verbal --

MR. SALOTTOLO: Verbal issuances, is the information --

THE WITNESS: I use a 300 telephone system. It's a very efficient means of communicating with them.

MR. SALOTTOLO: So essentially, that's immediate.

THE WITNESS: Yes, instantaneous. Just as soon as I hit the button, he answers the phone and we

talk.

MR. SALOTTOLO: Mr. Ayers, I wonder if you could briefly describe what weather information you use to net watch the Charlotte area.

THE WITNESS: The same equipment that we use to watch the rest of Atlanta center's air space: meteorological weather processor, which incorporates RWDS or remote radar display capability. That's basically it.

Of course, the NWP is all encompassing. I mean, it does have some radar information in it. It has satellite imagery graphics, observations, et cetera. It's all kind of all-inclusive.

MR. SALOTTOLO: The RRWDS radar remote display system has -- for the Charlotte area, you would be using Athens and Maiden?

THE WITNESS: That's correct.

MR. SALOTTOLO: And for the areas for the southern part of the Atlanta air space, you would be using -- what would you be using?

THE WITNESS: We have RRWDS input from -- within our air space, we have input from White Cross, Georgia; from Athens, Georgia; from Atlanta,

Georgia; from Centreville, Alabama; from Nashville, Tennessee; from Charleston, West Virginia; from Vollens, Virginia; from Maiden, North Carolina.

MR. SALOTTOLO: Do you have a --

THE WITNESS: Bristol -- Bristol, Tennessee. That's the one I forgot.

MR. SALOTTOLO: You testified earlier about a NEX -- a PUP, NEXRAD PUP?

THE WITNESS: Yes. That cannot be used for Charlotte.

MR. SALOTTOLO: Okay. What exactly -- briefly, what's a NEXRAD PUP?

THE WITNESS: PUP stands for principal user processor. It's a work station which is used to interrogate a NEXRAD and Doppler radar. We have a dedicated line to Maxwell Air Force Base, which is the RDA. Our antenna is located 25 miles northeast of Maxwell Air Force Base in Alabama. It provides information on activity up to 230 kilometers and velocity data up to 230 kilometers, rainfall activity data up to 460 kilometers.

MR. SALOTTOLO: On July 2, 1994, what other Doppler radar information did you have available on

your PUP?

THE WITNESS: Various NEXRAD sites across the United States. We have Doppler capability at the various sites across the United States. I can't give you an exact number. I think as of two days ago, we had 55. I would submit a guess on July 2nd, we probably had 35 across the -- spotted across the United States.

MR. SALOTTOLO: How about the radars that you would be using for North Carolina?

THE WITNESS: The question was now, did I have access?

MR. SALOTTOLO: No. The question was, what Doppler radars would you have access to that would have covered the North Carolina area?

THE WITNESS: What Doppler radars did I have access to --

MR. SALOTTOLO: Yeah.

THE WITNESS: -- that covered the North Carolina area?

MR. SALOTTOLO: North Carolina, yeah.

THE WITNESS: I did not have access to the two that I can think of that would surveil that area.

It would be Columbia, South Carolina. And there's another one which can be used to investigate the air space basically east and north of Charlotte up across Greensboro. We can use the Raleigh NEXRAD. But on the evening of the accident, that radar was not functional.

MR. SALOTTOLO: The Raleigh radar, how is that -- is that information obtained by modem dial-up?

THE WITNESS: That's inputted through the meteorologist weather processor at the NWP. We have some products in there. We receive products from WSI, Weather Services, Inc. They provide a NEXRAD data by the meteorologist weather processor.

MR. SALOTTOLO: Can you display the Raleigh-Durham -- I realize it wasn't operating, but can you display -- when it is operating, can you display the Raleigh-Durham information on the PUP, NEXRAD PUP?

THE WITNESS: Not on the PUP, no. In the meteorologist weather processor. It's a much smaller monitor. You can do some zooming. But it does not provide the capabilities of a PUP. That's a very elaborate work station and a very complex station. It requires time.

MR. SALOTTOLO: So you can't display any

other Doppler radars, except Maxwell on the PUP?

THE WITNESS: I can display Doppler that had access to it -- I mean, through dial-up capabilities. I estimated approximately 25 or 30 in the United States at that time.

MR. SALOTTOLO: But the only dedicated line is to Maxwell.

THE WITNESS: That's the way it is. You only have one dedicated line per PUP. The rest are dial-up capabilities.

MR. SALOTTOLO: And Maxwell is how far from Charlotte approximately?

THE WITNESS: It's way out of range.

MR. SALOTTOLO: It's out of range. Okay.

THE WITNESS: On the -- On July 2, 1994, was the Columbia WSR-88-D Doppler radar, was that available? Was that information available?

THE WITNESS: To me?

MR. SALOTTOLO: To you.

THE WITNESS: No.

MR. SALOTTOLO: Was it available in any other way to you? It was not available on the NEXRAD PUP; is that correct?

THE WITNESS: That's correct.

MR. SALOTTOLO: Was it available in any other form at the center where the --

THE WITNESS: Not through the meteorologist weather processor, and those are the two main means of getting information. It was not incorporated in the WSI graphics at that time, either.

MR. SALOTTOLO: Could you give us a reason as to why Columbia wasn't available --

THE WITNESS: I don't know.

MR. SALOTTOLO: -- on that day?

THE WITNESS: Pardon me?

MR. SALOTTOLO: On that day, why Columbia was not available?

THE WITNESS: Well, the port was non-accessible. I couldn't dial it up.

MR. SALOTTOLO: Now, when you say the port, are you talking about -- in order to dial up, you need a modem, you need a telephone line and you need some kind of hand-shake information, I guess.

THE WITNESS: And a port on the other end. A port on the other end has to be receptive to your requests. There are ports in each NEXRAD site that are

dedicated for use by CWSUs.

MR. SALOTTOLO: Now, who controls all of this? Does the weather service function as far as getting the ports set and the lines set up and the password set up?

THE WITNESS: No. That's a function of the FAA.

MR. SALOTTOLO: Have you generated any correspondence with the FAA regarding the Columbia data, Doppler data?

THE WITNESS: Yes, sir.

MR. SALOTTOLO: Could you just kind of briefly summarize what that correspondence was, when it was?

THE WITNESS: I just indicated that certain information was available through dial-up capability and these NEXRAD sites were operational. And I wanted information as to when our dial-up capability would be established.

MR. SALOTTOLO: This correspondence, was there -- how many times prior to July 2, 1994 did you correspond with the FAA regarding this data, this particular data source? Can you give us an estimate?

THE WITNESS: Two. Two.

MR. SALOTTOLO: To obtain a line to Columbia.

THE WITNESS: Two.

MR. SALOTTOLO: To the FAA. How many times have --

THE WITNESS: Two, T-W-O-.

MR. SALOTTOLO: Two. Okay, okay.

THE WITNESS: February 15th and May 10th.

MR. SALOTTOLO: Two, T-W-O, okay. Was the Columbia data available the last time you were at the CWSU?

THE WITNESS: Yes, sir.

MR. SALOTTOLO: Can you give us kind of a reason as to why all of a sudden it appeared at the CWSU?

THE WITNESS: A reason why?

MR. SALOTTOLO: Why? After -- the PUP has been there for what, a year or so?

THE WITNESS: We've had it about 18 months.

MR. SALOTTOLO: Eighteen months.

THE WITNESS: I believe it was February of 1993.

MR. SALOTTOLO: Why after 18 months and your

correspondence to the FAA regarding the data do you think that now it has -- it's available at the CWSU? What drove this thing, do you think?

THE WITNESS: I have no knowledge.

MR. SALOTTOLO: Would the Columbia WSR-88-D data been of more use in monitoring weather conditions in the Charlotte area on the afternoon and evening of the accident than, say, Athens and Maiden?

THE WITNESS: Well, at the time in question, as you notice on the log, I was focusing my attention on activity which was occurring in the Columbus TRACON air space, area 4 up at Atlanta center. And assuming that I had that focus, probably not would be the answer to the question. The weather was just better organized and -- you know -- I think a greater threat, in my judgement, to the safety and efficient flow of air traffic.

MR. SALOTTOLO: Now, as you indicated, most of your verbal issuances were to airports in the southern area of the Atlanta center?

THE WITNESS: That's correct.

MR. SALOTTOLO: Were they covered by Maxwell, most of those airports?

THE WITNESS: That's correct, with the exception of Augusta.

MR. SALOTTOLO: Would you say that in this instance, as far as the verbal issuances to these various airports, that the Doppler data was of value to you --

THE WITNESS: Yes, sir.

MR. SALOTTOLO: -- more so than conventional data?

THE WITNESS: Yes, sir.

MR. SALOTTOLO: Would the Columbia data be of -- generally be of more value to you than Athens and Maiden for just watching the air space in the northern sections?

THE WITNESS: Yes, sir.

MR. SALOTTOLO: On the PUP, you indicated you have a dedicated line to Maxwell. Can you also display information from a dial-up NEXRAD site at the same time on the same work station?

THE WITNESS: Yes, sir, there are two monitors. You have the capability of doing that. You can run an animation loop, for instance, on Maxwell at the same time that you're dialing up several radars and

they displayed in four panel display. We have that capability, for instance.

MR. SALOTTOLO: Now, the --

THE WITNESS: You can cycle from one NEXRAD site to another.

MR. SALOTTOLO: Now, the dedicated line essentially of your real time presentation, that's tied in directly --

THE WITNESS: That's correct.

MR. SALOTTOLO: -- to Maxwell.

THE WITNESS: Constant.

MR. SALOTTOLO: Constant. Now, the dial-up would be you have to dial in and you would only get the products that were generated during the time you dial and actually connect?

THE WITNESS: Well, normally what you would do, you would set up the loop up, I mean, you know, to continue the dial. It would -- for instance, dial Columbia, South Carolina. It would give you the charts that you requested from it, the information that you requests. It would hang up there. It would go, for instance, to Atlanta, interrogate their NEXRAD, display that information. You could connect it next to

Birmingham, Alabama; require information from that. Then by inserting the proper instructions on the user function, you could say, okay, I want you to go back to Columbia and run the loop again.

MR. SALOTTOLO: Okay. I guess what I'm getting at is we're not talking -- in some instances, there may be delay between the presentation you get and the actual time of so many minutes. Is that correct?

THE WITNESS: Well, that's correct, because the Doppler radar -- you know -- it does its thing, so to speak, based on scan strategy. The normal mode of operation is VCP-21, which completes its tasks in approximately six minutes.

MR. SALOTTOLO: So, under some circumstances, there may be a six-minute or more time lag -- at least a six-minute time lag depending upon when you dial in?

THE WITNESS: You would get an up -- I mean, the earliest for a new product to come in, you would have to wait approximately six minutes if it was in that scan strategy.

MR. SALOTTOLO: Now, you seem very knowledgeable about NEXRAD and the NEXRAD PUP. Have you gone to any training?

THE WITNESS: Yes, sir. It's a requirement that all forecasters in the National Weather Service receive training at the training facility out in Normal, Oklahoma.

MR. SALOTTOLO: Is this a several week, several month course?

THE WITNESS: Four weeks, one month.

MR. SALOTTOLO: Four weeks.

THE WITNESS: One month. It's very intense training. It's like going back to college.

MR. SALOTTOLO: You indicated that you've been at the CWSU Atlanta center weather service unit since 1978?

THE WITNESS: That's correct.

MR. SALOTTOLO: I wonder if you could kind of give us a sense of how the CWSU has kind of evolved during this time period, as far as acceptance by the FAA, the equipment, the acceptance by people in the industry?

THE WITNESS: I think from day one our acceptance in the Atlanta center was the best. I think they have tried to use the information to fulfill their mission, which is to provide the safe and efficient

flow of air traffic. And I think as technologies have come along, I think we're providing better assistance.

MR. SALOTTOLO: Do you believe the services of the center weather service unit are used more in planning than in short term forecasting and detection of hazardous weather?

THE WITNESS: I think they're probably used equally.

MR. SALOTTOLO: Do you feel the equipment at the center weather service unit is sufficient to fulfill your duties?

THE WITNESS: At this time?

MR. SALOTTOLO: At this time.

THE WITNESS: Mm-hmm.

MR. SALOTTOLO: You do. If you had a wish list, so to speak, of equipment you'd like to have --

THE WITNESS: I think it would be great to be able to switch your dedicated line from one NEXRAD site to another so that you wouldn't have to go through this dial-up capability. I think it would be nice to have a little bit better work station. It's not very user friendly right now. Lots of menus and it's somewhat time consuming to get to where you need to be

sometimes.

MR. SALOTTOLO: Now, we're talking of PUP now, when you say work station, of the MWP?

THE WITNESS: No, I'm talking about the meteorologist weather processor, the MWP.

MR. SALOTTOLO: You're the Meteorologist in Charge of the unit.

THE WITNESS: That's correct.

MR. SALOTTOLO: Do you think manpower is sufficient to fulfill your duties there?

THE WITNESS: At this time. At this time.

MR. SALOTTOLO: You keep saying at this time. I'm not sure what -- at a later time, it may not be? What would --

THE WITNESS: It depends on what technologies come down the road here in the next few years. You know, how labor intense it becomes is difficult to say.

MR. SALOTTOLO: How would you describe the work load?

THE WITNESS: It varies quite a bit. On days where we have a lot of thunderstorms occurring in the air space, it's more than one person can handle.

MR. SALOTTOLO: How about the afternoon of

July 2, 1994?

THE WITNESS: On that particular day?

MR. SALOTTOLO: Yes.

THE WITNESS: I would say probably light.

MR. SALOTTOLO: I'm sorry?

THE WITNESS: Probably light.

MR. SALOTTOLO: Light. Okay. On the afternoon and evening of July 2, 1994, was all of the equipment operating normally?

THE WITNESS: We had had some problems with the NEXRAD enhancement and the meteorologist weather processor over a period of two months there. We had some stability problems and there was some questions about that part of the system.

MR. SALOTTOLO: Thank you, Mr. Ayers. I have no further questions at this time.

CHAIRMAN HAMMERSCHMIDT: Thank you, Mr. Salottolo. Going to the parties, Federal Aviation Administration.

MR. DONNER: Just one or two quick questions, sir. Going back to page 6 of the Exhibit, the meteorological impact statement; are they issued on a regular basis or as-needed?

THE WITNESS: As-needed.

MR. DONNER: How would you characterize the frequency with which they're issued in the summertime in the southeast?

THE WITNESS: Well, with regularity. On thunderstorm days, you're going to have one, two, perhaps three issued per day.

MR. DONNER: Thank you.

CHAIRMAN HAMMERSCHMIDT: Thank you, Mr. Donner. The National Air Traffic Controllers Association.

MR. PARHAM: Mr. Ayers, on the evening of July 2nd, who attended the stand-up briefing at Atlanta center? Who normally attends the stand-up briefing?

THE WITNESS: As I indicated before, area supervisors, area managers.

MR. PARHAM: Does TMU attend those?

THE WITNESS: That's correct. They also use their representative there, too.

MR. PARHAM: The information that you passed out, the stand-up, do you know what is done with that information? Who it's disseminated to?

THE WITNESS: I believe they take it back to

their areas of responsibility and provide that information to controllers in their area.

MR. PARHAM: What information about Charlotte was briefed by you at the stand-up that evening?

THE WITNESS: Well, basically, the same information that you'll find on page 5 of document 5-C, "Potential for widely scattered thunderstorms throughout the air space. It probably would be more of an isolated nature in the northern half of the air space."

MR. PARHAM: Just a general forecast of what might occur. Nothing that was occurring at the time?

THE WITNESS: Yes, sir. We also elaborate on what -- you know -- what we observe at the time of the stand-up briefing. That's a part of the briefing. Indicated there was immediate concern, just a general resume of what's being observed at that time.

MR. PARHAM: Are you required by your duties and responsibilities to disseminate any specific weather information to the remote towers?

THE WITNESS: No. The net impact statement center weather advisories and the 300 telephone conversations are all directed to remote towers.

MR. PARHAM: When you call Charlotte, who do you talk to when you brief them?

THE WITNESS: The TRACON.

MR. PARHAM: Who at the TRACON, do you know?

THE WITNESS: The formal briefing occurs, usually it's the supervisor that's on duty at that time.

MR. PARHAM: Just for clarification, I believe you had said that it was your discretion as to whether you would pass a level 3 or 4 thunderstorm, like Charlotte, for example. Is there any levels that you're required to pass?

THE WITNESS: No, sir.

MR. PARHAM: So it's your discretion, level 1 through 6?

THE WITNESS: That's correct.

MR. PARHAM: During the --

THE WITNESS: They frequently ask us questions about what's -- it's a give and take. It's not a one-way means of communication here. We frequently call them and they frequently call us to get information that's in their air space.

MR. PARHAM: During the evening prior to the

accident, did you brief the Atlanta center area supervisors that deal with the Charlotte area about any weather in the Charlotte area that might impact the traffic?

THE WITNESS: The contact, as I indicated before, was primarily through the stand-up briefing which took place at 1910 UTC.

MR. PARHAM: I have no further questions, Mr. Chairman.

CHAIRMAN HAMMERSCHMIDT: Thank you, Mr. Parham. Honeywell.

MR. THOMAS: We have no questions. Thank you.

CHAIRMAN HAMMERSCHMIDT: Thank you. Air Line Pilots Association.

MR. TULLY: No questions.

CHAIRMAN HAMMERSCHMIDT: Thank you. USAir.

MR. SHARP: We have no questions, Mr. Chairman.

CHAIRMAN HAMMERSCHMIDT: Thank you. Douglas Aircraft Company.

MR. LUND: No questions, Mr. Chairman.

CHAIRMAN HAMMERSCHMIDT: The Association of

Flight Attendants.

MS. GILMER: No questions.

CHAIRMAN HAMMERSCHMIDT: No questions. Thank you. Dispatchers Union.

MR. SCHUETZ: No questions, Mr. Chairman.

CHAIRMAN HAMMERSCHMIDT: Pratt and Whitney.

MR. YOUNG: No questions. Thank you.

CHAIRMAN HAMMERSCHMIDT: National Weather Service.

MR. KUESSNER: No questions.

CHAIRMAN HAMMERSCHMIDT: Let's see. International Association of Machinists aren't here, yet, I take it. Okay. No answer, so no questions.

Any more questions from the tech panel? Okay. Mr. Feith.

MR. FEITH: You stated previously that you didn't have access to the Columbia Doppler at the time of the event. Is that correct?

THE WITNESS: That's correct.

MR. FEITH: Do you know why you didn't have access?

THE WITNESS: No, sir, I don't.

MR. FEITH: Do you know if you have access

now to that radar?

THE WITNESS: Yes, sir.

MR. FEITH: And do you know at what time that access became available after the accident?

THE WITNESS: September 13th.

MR. FEITH: Do you know what prompted that?

THE WITNESS: No, sir.

MR. FEITH: Do you know how many lines you have access to that system?

THE WITNESS: At this time, across the entire United States, I would say approximately 55 NEXRAD sites.

MR. FEITH: How many dedicated lines do you have?

THE WITNESS: There is only one per PUP.

MR. FEITH: No further questions.

CHAIRMAN HAMMERSCHMIDT: Thank you. Mr. Laynor.

MR. LAYNOR: Just for clarification, is a NEXRAD a Maxwell WSR-88 -- I mean, the Doppler?

THE WITNESS: The 88-D, that's the correct terminology, sir.

MR. LAYNOR: That is a NEXRAD at Maxwell, and

Doppler.

THE WITNESS: NEXRAD and Doppler and 88-D are synonymous.

MR. LAYNOR: Currently as I understand it, you can use the NEXRAD at Columbia, but you must initiate the request, the dial-up capability.

THE WITNESS: That's correct.

MR. LAYNOR: What would prompt you to do that?

THE WITNESS: Concern about weather developments in that weather. That would be the same that would prompt you to dial any other NEXRAD sites.

MR. LAYNOR: This would be a request from a controller to --

THE WITNESS: No. That's our judgement. That's our judgement, where we think we are going to have an area of weather that we have to watch, we would set the PUP up to dial up the radar which we thought would be -- which would give us some very useful information.

MR. LAYNOR: How would it come to your attention, for example, in a rapidly developing conductive situation that there was something there

that you wanted to see?

THE WITNESS: A meteorologist knows pretty much when circumstances are going to take place. You study the atmosphere and you begin to look for things. You have radar. In our case, for instance, you do have a mosaic radar and an MWP that gives us a general idea. It's a mosaic that gives you an idea where activity is starting to break out.

MR. LAYNOR: This may be difficult to answer, but if you had that capability on July 2nd, do you think you'd have used it?

THE WITNESS: Well, as I indicated on my statement here, I was focused on developments in the Columbus-Georgia area at the time the accident occurred. That would be difficult. That's a hypothetical situation.

MR. LAYNOR: Currently you use both the WSR-57 and the NEXRAD. Have you in your experience in dialing up the NEXRAD seen significant differences in the VIP level of storms?

THE WITNESS: Yes, sir.

MR. LAYNOR: Can you --

THE WITNESS: Yes, sir.

MR. LAYNOR: Can you elaborate on that a little bit?

THE WITNESS: It's a fantastic radar. It's just later technology. As the 88 indicates, this is 1988 vintage technology. As the 57 indicates, that's 1957 technology.

MR. LAYNOR: If you see a level 3 perhaps on the WSR-57 and you look and check it out on the '88, have you noticed like level 5 or level 6?

THE WITNESS: I would say that the experience I've had, it would probably run 1 to 2 level intensity above the comparisons that I've made.

MR. LAYNOR: Do you know if there are any current plans to put dedicated lines in for the Columbia NEXRAD for the -- to look into Charlotte?

THE WITNESS: We only have one dedicated line capability per PUP. And the plans at this time are to transfer our dedicated line from Maxwell Air Force Base to Peach Tree City, Georgia. We only have one dedicated line available, period. That's per PUP.

MR. LAYNOR: What area of coverage would that change give you? I didn't quite understand. This is Peach Tree?

THE WITNESS: Well, of course, the radar is located approximately 100 miles northeast of the NEXRAD down there at Montgomery, Alabama, so it would extend your range further north, probably into the extreme southern Tennessee, around the Chattanooga area, for instance, and probably into the extreme western portions of South Carolina.

MR. LAYNOR: Okay. Thank you, sir.

CHAIRMAN HAMMERSCHMIDT: Mr. Clark.

MR. CLARK: Just a few. You indicated that within the last 75 days, there have been 25 to 30 additional radars on line at your facility or that you have access to.

THE WITNESS: I'm sorry?

MR. CLARK: You indicated that there were 25 or 30 additional radars that you have access to, that came on-line in the last 75 days or since the accident.

THE WITNESS: Are you adding 25 and 25 to get --

MR. CLARK: Well, you said at the time of the accident, there were 25 or 30 on line, and you believe there are 55 now.

THE WITNESS: Approximately. Maybe in the

low 50s. It might be 53, somewhere in that area.

MR. CLARK: Are those new radars coming? Are they being commissioned or is it just your facility that's being --

THE WITNESS: Some have been commissioned and some have been accepted.

MR. CLARK: Are these coming on line per some schedule; or has the schedule changed since the accident?

THE WITNESS: Not to my knowledge. I think the schedule is pretty going on as planned.

MR. CLARK: Is there a schedule that we may predict a larger number in the next 75 days?

THE WITNESS: I suppose. I'm not real privy to this information, but I suppose that that's really the National Weather Service headquarters priority.

MR. CLARK: Did the Columbia radar come on line per schedule? I guess you've indicated you don't know the schedules.

THE WITNESS: To my knowledge, it came on line and neither one was expected to come on line.

MR. CLARK: Thank you.

CHAIRMAN HAMMERSCHMIDT: Mr. Schleede.

MR. SCHLEEDE: No questions.

CHAIRMAN HAMMERSCHMIDT: Mr. Ayers, is there anything you'd like to add for the record?

THE WITNESS: No, sir.

CHAIRMAN HAMMERSCHMIDT: Is there anything that you'd like to say subjectively in terms of the weather dissemination on the date of the accident?

THE WITNESS: I think I did the best possible job I could do given the circumstances.

CHAIRMAN HAMMERSCHMIDT: Okay. Thank you very much.

(Witness excused.)

CHAIRMAN HAMMERSCHMIDT: Witness number three, Mr. Fred Masi, would you please come forward? Mr. Masi will be questioned by Ms. Sandy Simpson. I might mention that Mr. Masi was the final radar west controller in the Charlotte control tower.

FRED MASI, FINAL RADAR WEST CONTROLLER, CHARLOTTE CONTROL TOWER, CHARLOTTE, NORTH CAROLINA

Whereupon,

FRED MASI,

having been first duly sworn was called as a witness herein and testified as follows:

MR. SCHLEEDE: Mr. Masi, please state your full name and business address.

THE WITNESS: Fred Vincent Masi, 3860 Josh Birmingham Highway, Charlotte, North Carolina.

MR. SCHLEEDE: By whom are you employed?

THE WITNESS: RVR Transportation, Federal Aviation Administration.

MR. SCHLEEDE: In what position?

THE WITNESS: Air Traffic Control Specialist.

MR. SCHLEEDE: How long have you been a controller?

THE WITNESS: I've been in Charlotte 11 years.

MR. SCHLEEDE: Could you briefly describe your education an experience that qualifies you for your position?

THE WITNESS: I went through air traffic control training school in the United States Air Force. I did approximately six and a half years as an air traffic controller and administrator in the Air Force before coming out with the FAA in 1983. And I've been in Charlotte since 1983 in the capacity of air traffic control.

MR. SCHLEEDE: Do you hold any FAA ratings?

THE WITNESS: Yes. I hold a single engine land private pilot's license.

MR. SCHLEEDE: Thank you. Ms. Simpson will continue.

MS. SIMPSON: Thank you, Mr. Schleede. Mr. Masi, I'd just like to ask you a few questions

regarding your duties and responsibilities, the accident, flight and equipment that you used. The night of the accident, you were assigned to the radar final west control position. Could you briefly describe your duties and responsibilities as the final radar west controller?

THE WITNESS: Yes. I'm responsible for all aircraft in my area from approximately -- from 6,000 feet and below in my area. Basically I just run a final approach. Turn the aircraft on the final approach, clear them for the final approach and switch them over to the tower.

MS. SIMPSON: Prior to and during the accident sequence, could you describe your work load and the complexity?

THE WITNESS: The work load was light and the complexity was light or to none.

MS. SIMPSON: Can you describe the weather conditions during the time you were working the final radar west position?

THE WITNESS: Do you mean at the time of the accident or before?

MS. SIMPSON: While you were on the position?

THE WITNESS: While I was on position, as I recall -- I don't have the weather sequence in front of me, but it was six miles and haze.

MS. SIMPSON: Was the weather ever a factor the night of the accident as the final radar west controller?

THE WITNESS: It was a normal night, a normal final approach. I was -- everything was as routine as can be that night.

MS. SIMPSON: Can you describe the flight of USAir 1016 as you recall it?

THE WITNESS: His flight was as normal as anybody else's that evening.

MS. SIMPSON: In your opinion, what is normal?

THE WITNESS: Nothing caught my eye to look at something. Everything was just -- the flight path was normal, the approach was normal. Everything was just by the book.

MS. SIMPSON: The aid that tells the ILS approach, why did you change the accident flight to a visual approach?

THE WITNESS: Because my traffic work load

was light and I had the time to donate to USAir 1016.

MS. SIMPSON: You changed it back to an ILS approach?

THE WITNESS: Yes, I did.

MS. SIMPSON: Why was that?

THE WITNESS: Because I saw some weather developing just north of the final and approximately on or near the airport. And I didn't -- I knew it was rain. And I just didn't -- rain is an obstruction to visibility, so I didn't want him to have to go around because he lost the airport due to the rain.

MS. SIMPSON: The weather that you saw, where was that located?

THE WITNESS: The weather that I saw in my air space was on the final, approximately at the approach on the runway or just north of it.

MS. SIMPSON: What intensity was that?

THE WITNESS: It was level 3.

MS. SIMPSON: How did you determine that intensity?

THE WITNESS: By using my weather panel on the ASR-9.

MS. SIMPSON: Did you advise the flight crew

of USAir 1016 that you saw a level 3?

THE WITNESS: I did not tell him it was level 3. I told him that it was weather developing on or near the final approach, just north of the final.

MS. SIMPSON: If you see weather that is an intensity, such as a level 3, are you required to issue that to a pilot?

THE WITNESS: No, I'm not.

MS. SIMPSON: You also stated during one of our interviews or one of our conversations that due to the proximity of the antennae, you saw only a portion of the weather. Can you explain that statement, please?

THE WITNESS: Well, the radar antennae there has a cone of silence, where there is no -- you can't get a target, an aircraft target, or even any kind of return due to the position of the antenna. So that weather could have been all the way south of the final approach. I could not see it.

MS. SIMPSON: So what portion can you see?

THE WITNESS: I saw what showed up on my radar scope, which was approximately at the approach end of the runway or just north of it. It was moving

from the south to the north.

MS. SIMPSON: So with your radar antennae, you saw only the northern part of the airport and not the southern part due to this cone of silence of the ASR-9?

THE WITNESS: I didn't see any weather at the southern portion of the airport, no, I did not.

MS. SIMPSON: Do you know if weather intensities are reduced due to the antenna?

THE WITNESS: No, I don't.

MS. SIMPSON: You don't know, or they aren't?

THE WITNESS: Pardon me?

MS. SIMPSON: I'm sorry. You don't know if they are reduced or they aren't reduced?

THE WITNESS: I don't know if they are reduced.

MS. SIMPSON: While you've been working at characteristic, is the ASR-9 the only radar system you've used?

THE WITNESS: No. We've had the ASR-4 and then the ASR-9.

MS. SIMPSON: So you went from the ASR-4 to the ASR-9?

THE WITNESS: Yes.

MS. SIMPSON: How would you characterize the capabilities of the ASR-9 compared with the ASR-4?

THE WITNESS: The ASR-9 gives us the capability of looking at the weather, the different intensities of the weather, 1 through 6.

MS. SIMPSON: You did not --

THE WITNESS: Precipitation. I should say precipitation, because that's what it shows.

MS. SIMPSON: Do you issue any information any differently now that you have the ASR-9 than you had with the ASR-4?

THE WITNESS: I'm having a hard time hearing this.

MS. SIMPSON: The ASR-9 --

THE WITNESS: Yes.

MS. SIMPSON: -- now gives you levels 1 through 6.

THE WITNESS: Mm-hmm.

MS. SIMPSON: The ASR-4 did not, correct?

THE WITNESS: Correct.

MS. SIMPSON: Do you issue two pilots any additional information now that you have the ASR-9 than

you did prior when you only had the ASR-4?

THE WITNESS: We just tell them about the area of weather, weather echoes, and issuing -- if they ask for it, we can tell them it's a level 3, level 2, level 1.

MS. SIMPSON: Is that a controller discretion?

THE WITNESS: Yes, it is.

MS. SIMPSON: And the ASR-4, what information would you issue then?

THE WITNESS: We wouldn't have that capability at all

MS. SIMPSON: Since the ASR-9 was commissioned, have you or anyone else at the facility experienced any difficulties or any problems with that equipment?

THE WITNESS: Yes.

MS. SIMPSON: Can you explain some of those problems?

THE WITNESS: We've lost radar several times. We've lost the beacon system. It has gone out several times.

MS. SIMPSON: Have you ever had any problems

with the weather channel on the ASR-9?

THE WITNESS: No.

MS. SIMPSON: Have you ever filed a UCR, an unsafe condition report on the ASR-9?

THE WITNESS: Not personally, no.

MS. SIMPSON: Have any of your peers filed a UCR?

THE WITNESS: I don't know.

MS. SIMPSON: To the best of your knowledge, have the problems that you discussed been corrected?

THE WITNESS: To the best of my knowledge.

MS. SIMPSON: The night of the accident, did you experience any of the problems that you mentioned?

THE WITNESS: No, none.

MS. SIMPSON: Were you satisfied with the presentation of the ASR-9 the night of the accident?

THE WITNESS: Yes, I was.

MS. SIMPSON: Mr. Masi, regarding the ASR-9, did you receive any training on the equipment before the radar system was commissioned?

THE WITNESS: Yes. Yes, I did.

MS. SIMPSON: Specifically, what kind of training was that?

THE WITNESS: We got training through our briefings, team briefings. And we were given material to read during those times. And we were briefed by our team supervisor.

MS. SIMPSON: And how are your team briefings conducted?

THE WITNESS: They're conducted weekly on different -- on things that we need to be caught up with or new items that are coming down the road to give us a heads-up and let us know what's going on.

MS. SIMPSON: So approximately how much time was spent on the ASR-9 in training?

THE WITNESS: I couldn't begin to guess.

MS. SIMPSON: Was it more than -- would you say more than a day, half a day?

THE WITNESS: You mean, an eight hour day?

MS. SIMPSON: Correct. Well, not total considering. How long do you spend in a team brief?

THE WITNESS: An hour, hour and a half.

MS. SIMPSON: So about how long -- I mean, how many team briefs approximately?

THE WITNESS: I believe just one.

MS. SIMPSON: So about an hour and a half.

THE WITNESS: About an hour and a half.

MS. SIMPSON: And you read -- did you actually have any hands-on training on the ASR-9 prior to its use?

THE WITNESS: No.

MS. SIMPSON: Do you believe the training that you received was adequate for you to do your job?

THE WITNESS: Yes.

MS. SIMPSON: Can you explain how the different levels of precipitation are depicted on the radar display?

THE WITNESS: They're depicted as lightest intensity -- it would be a light shade; and the heaviest intensity would be a dark shade of green.

MS. SIMPSON: So you have six different shades on the radar display?

THE WITNESS: No, just two. We can select up to three if we want to see three. And the lightest -- the lowest number that we would select would come in the lightest. And the highest number we would select would be the darkest.

MS. SIMPSON: So then two obviously would be the middle one.

THE WITNESS: Right. And it would be blank.

MS. SIMPSON: During one of our conversations, you said that there were no levels 4, 5 or 6 available. What do you mean by that?

THE WITNESS: There wasn't any level 4, 5 or 6 weather detected on my scope or in the Charlotte terminal area at the time.

MS. SIMPSON: Would you say that was prior to and after the accident or just prior to the accident?

THE WITNESS: Prior to and during.

MS. SIMPSON: And during. How long were you on position afterwards?

THE WITNESS: Approximately 20 minutes.

MS. SIMPSON: Did you see any 4's, 5's or 6's during that time?

THE WITNESS: I believe I saw a 4.

MS. SIMPSON: Approximately when was that?

THE WITNESS: Two minutes after.

MS. SIMPSON: Where was that located?

THE WITNESS: I don't know.

MS. SIMPSON: Approximately?

THE WITNESS: I have no idea, because it could be 30 miles away and I'm only looking at

approximately 20-25 to 30 miles. It could be south, west or east of my position.

MS. SIMPSON: So you're saying you saw a level 4 available on the radar. However, you did not actually see it on the radar display?

THE WITNESS: On my display, I did not see it. It could have been -- it probably was on someone else's display, but it wasn't on mine the way I had my scope set up that day.

MS. SIMPSON: How did you have your radar scope set up?

THE WITNESS: I had it set up in final -- for final configuration. Basically, I set it -- move it to the south, so I'm looking at air space north of the airport.

MS. SIMPSON: Approximately how many miles?

THE WITNESS: Twenty-five to 30.

MS. SIMPSON: And at that time, was the circular polarization on or off?

THE WITNESS: I have no idea.

MS. SIMPSON: Your supervisor doesn't come around and tell you that the CP is on or linear polarization is on or off while you're working?

THE WITNESS: Normally we're in linear polarization all of the time. The best I know we're in linear polarization and with the ASR-9 with the weather.

MS. SIMPSON: What effect does a circular polarization have on your display?

THE WITNESS: The circular polarization, it diminishes the primary radar returns of the actual aircraft hanging the target.

MS. SIMPSON: Nothing to do with weather?

THE WITNESS: It did on the ASR-4. We used to use it a lot on the ASR-4. But on the ASR-9, I don't even believe we have it.

MS. SIMPSON: In your experience at Charlotte -- you said you've been there approximately -- actually, today is your anniversary and you have 11 years.

THE WITNESS: That's right.

MS. SIMPSON: In your experience, how often do you get level 1, 2 and 3?

THE WITNESS: Level 1, 2 and 3 weather?

MS. SIMPSON: Right.

THE WITNESS: In the summertime, all of the

time.

MS. SIMPSON: Every day you're working basically in the radar?

THE WITNESS: Just about every day, especially in the afternoons and evenings, yes.

MS. SIMPSON: How about a 4, 5 or 6?

THE WITNESS: About half that time.

MS. SIMPSON: You stated that the weather popped up as a level 3?

THE WITNESS: Yes.

MS. SIMPSON: As a time correlation, approximately where was USAir 1016 when you saw that?

THE WITNESS: He was approximately on mid field down wind. I descended -- initially I descended him to 4,000. Then when I changed my mind to give him the visual approach, I just sent him to 2,300. I don't have the times in front of me, but when I saw that weather popped up, that's when I changed him back to an ILS approach. So it would be -- he was approximately mid-field down wind descending under 6,000.

MS. SIMPSON: Is it standard practice in your facility to not issue levels of weather intensity displayed on the radar?

THE WITNESS: I can't answer that. I don't know.

MS. SIMPSON: Has anyone ever made any comments to you during evaluations over the shoulders or just anybody watching for not issuing levels of weather?

THE WITNESS: No.

MS. SIMPSON: Did you ever give OJT in the radar room or in the tower?

THE WITNESS: Yes.

MS. SIMPSON: Have you ever advised anyone or made any statements regarding their not issuing the weather information?

THE WITNESS: No, I haven't.

MS. SIMPSON: You stated earlier that you're certified in the tower. Is the weather information you issue as a radar controller any different than how you would issue it from the tower?

THE WITNESS: From the radar room to the tower?

MS. SIMPSON: Correct.

THE WITNESS: No. It's the same.

MS. SIMPSON: So if you saw on the D-BRITE

radar levels of weather, you would state that?

THE WITNESS: I might if I was issuing that, yes.

MS. SIMPSON: If you were issuing that?

THE WITNESS: If I was issuing it, I would tell him an area of weather. I'd tell him that there's an area of weather.

MS. SIMPSON: As a tower controller -- you are certified tower and radar, correct?

THE WITNESS: Yes.

MS. SIMPSON: Weather phenomena like rain is visible also on the D-BRITE and also out the window. Do you advise pilots of rain or lightning that you see out the window?

THE WITNESS: If I'm working in the tower, yes. If there's rain on the airport, I advise them there is rain on the airport and lightning, and give him the direction that I see it at. West of the airport, south of the airport, whatever that is.

MS. SIMPSON: When was the last time you had a chance to review the transcript; was it just recently?

THE WITNESS: Yes, just recently, not in the

last day.

MS. SIMPSON: The night of the accident, you made a transmission advising that the tower visibility was one mile.

THE WITNESS: Yes.

MS. SIMPSON: How were you made aware of that information?

THE WITNESS: I was told that by the arrival radar supervisor.

MS. SIMPSON: Did he come around and tell you to advise all of the pilots that the visibility was one mile?

THE WITNESS: No. That's my job.

MS. SIMPSON: What did he tell you?

THE WITNESS: What did I tell the pilots?

MS. SIMPSON: No. I'm sorry. What did the supervisor tell you?

THE WITNESS: He told me that tower visibility was one mile, and I broadcast that.

MS. SIMPSON: So he was just basically walking around the room telling all of the controllers?

THE WITNESS: Walking -- I don't know what he was doing to the other controllers, but he told me it

was one mile.

MS. SIMPSON: When the visibility decreases from six miles to one mile, what effect does that have on your work load as final radar west controller?

THE WITNESS: At that particular day, none.

MS. SIMPSON: Do you have runway visual range equipment at your position in the radar room?

THE WITNESS: Yes.

MS. SIMPSON: The night of the accident, was it activated?

THE WITNESS: It was activated and turned on after the accident.

MS. SIMPSON: By whom?

THE WITNESS: By the radar supervisor.

MS. SIMPSON: Do you know why?

THE WITNESS: Because the visibility went to a mile. As soon as it went to a mile, he turned it on.

MS. SIMPSON: Do you recall if there were any readings?

MS. SIMPSON: No, I don't recall that.

THE WITNESS: Do you recall what the runway lights were set on?

MS. SIMPSON: I can't recall that. I was in

the radar room. I don't know.

THE WITNESS: Is there an indication on the RVR as to the runway settings?

THE WITNESS: Yes, but I did notice any.

MS. SIMPSON: Did you notice -- you might have just answered this. Did you notice if there was a reading at all?

THE WITNESS: No, I didn't.

MS. SIMPSON: Do you know if the approach lights were on?

THE WITNESS: No, I don't.

MS. SIMPSON: At 2242:02, you transmitted, "Attention all aircraft, wind shear alert, all quadrants. Surface winds at this time are 110 at 21." Where did you get the information?

THE WITNESS: I got that from the arrival wall supervisor, the same person.

MS. SIMPSON: To the best of your knowledge, was USAir 1016 on frequency when you issued this alert?

THE WITNESS: He wasn't on that. He was not on my frequency when I issued that alert or the tower visibility.

MS. SIMPSON: Thank you. I have no further

questions.

CHAIRMAN HAMMERSCHMIDT: Thank you, Ms. Simpson. Let's see, National Air Traffic Controllers Association.

MR. PARHAM: Fred, you had mentioned the cone of silence, where you lose targets in weather over the radar site?

THE WITNESS: Yes.

MR. PARHAM: Is that unusual --

THE WITNESS: No.

MR. PARHAM: -- or is it normal?

THE WITNESS: It's an every day occurrence. Every time we have an aircraft that goes over the antenna, we will lose radar contact with that target until he comes out of the other side of it.

MR. PARHAM: Do you expect that when you're working the aircraft?

THE WITNESS: Every day, yes.

MR. PARHAM: Do you anticipate that in the way you work the aircraft?

THE WITNESS: Yes.

MR. PARHAM: How long have you used the ASR-9 at Charlotte?

THE WITNESS: Approximately four years.

MR. PARHAM: So you now feel -- or do you now feel very comfortable using the ASR-9?

THE WITNESS: I felt comfortable from the day it was commissioned.

MR. PARHAM: To clarify a previous question, on that night, did the supervisor advise you of whether you were on linear polarization or circular polarization?

THE WITNESS: No one advised me of that, no, sir.

MR. PARHAM: Have you given OJT instruction or during your giving OJT instruction, have you instructed other controllers on the use of ASR-9?

THE WITNESS: Yes.

MR. PARHAM: The runway lights is a function of what part of the TRACON?

THE WITNESS: The runway lights?

MR. PARHAM: Yes.

THE WITNESS: We have no --

MR. PARHAM: Who is responsible for the runway lights in the TRACON?

THE WITNESS: No one.

MR. PARHAM: Who is responsible at Charlotte for that?

THE WITNESS: The tower supervisor or controller in charge.

MR. PARHAM: Do you have an oral alarm for the RVR over your position?

THE WITNESS: Yes.

MR. PARHAM: Did it sound that night?

THE WITNESS: I don't recall.

MR. PARHAM: The approach lights, is that a function of the TRACON?

THE WITNESS: No, it's not.

MR. PARHAM: What is that a function of?

THE WITNESS: The control tower.

MR. PARHAM: Thank you, Fred. Mr. Chairman, I have no further questions.

CHAIRMAN HAMMERSCHMIDT: Thank you, sir. Honeywell.

MR. THOMAS: No questions. Thank you.

CHAIRMAN HAMMERSCHMIDT: Thank you. Air Line Pilots Association.

MR. TULLY: Mr. Masi, you testified that you are not required to issue the precipitation levels to

aircraft; is that correct?

THE WITNESS: That's correct.

MR. TULLY: Do you know of any paragraphs in the Air Traffic Control Handbook 7110.65H which might require you to issue pertinent weather to aircraft?

THE WITNESS: We have to issue pertinent weather, but we're not required to issue levels.

MR. TULLY: Are you aware of the examples they give in that document, examples of language which you are to use to issue --

THE WITNESS: Level 1, level 2 -- or echoes, weather echoes, yes.

MR. TULLY: Okay. So if you observed a level 3 cell on the approach course and you wish to advise the aircraft of that fact, you're aware that the handbook directs you to make that advisory with specific language?

THE WITNESS: Yes, it does.s

MR. TULLY: But you have the -- you feel you have the option to not advise the aircraft of that information; is that correct?

THE WITNESS: I think you misunderstand me. I have a legal and a moral obligation to issue an

aircraft any pertinent weather that would be adverse to his flight.

MR. TULLY: I guess the point I'm getting at is that at a time of about 2236 and 55, you say something to the effect, "Rain south of the field, might be some coming off north, expect the --

THE WITNESS: It might be moving off from the south to the north, yes.

MR. TULLY: By that, you meant to indicate that there was a level 3 cell which you had observed on the ASR-9 radar; is that correct?

THE WITNESS: That's correct.

MR. TULLY: Okay. Then if you're familiar with the phraseology in the Air Traffic Control Handbook, why wouldn't you use the specific language with regard to the level? Isn't that required by the handbook?

THE WITNESS: I didn't use that, no.

MR. TULLY: Mr. Masi, I'd like to just ask you a few questions about how weather information is transferred through your facility, requirements to report weather between the controllers.

When USAir 1016 checked in with the arrival

west, you're aware that he reports information Yankee; is that correct?

THE WITNESS: He is supposed to. I don't know if he did or not.

MR. TULLY: Well, we could look at the transcript, and I think you'd see that.

THE WITNESS: If it says that in the transcript, that's what happened, yeah.

MR. TULLY: Is it your presumption when he checks on with you, that he has information Yankee?

THE WITNESS: Yes.

MR. TULLY: Did you receive any reports through your facility, say, from the tower cab or any of the supervisors to indicate to you that weather conditions at the airport were changing to conditions that were substantially different from information Yankee?

THE WITNESS: Not until after I had switched him to the control tower.

MR. TULLY: Okay. During the time period of 2235 and 16 -- that's when USAir 1016 checked on your frequency -- and the time he left your frequency was, I believe 2239 and 25; are you aware that the RVR was

decreasing on runway 18 right?

THE WITNESS: No.

MR. TULLY: You state that it was the arrival wall coordinator that informed you that the tower visibility had decreased to one mile?

THE WITNESS: Yes.

MR. TULLY: Is that correct?

THE WITNESS: Yes.

MR. TULLY: And at that time, you turned on your RVR reporting equipment?

THE WITNESS: He did.

MR. TULLY: He did. Okay. So at a time of 2240 and 01, I believe, it's when you broadcast, "Attention all aircraft. Tower visibility one mile." Do you remember making that transmission?

THE WITNESS: Yes, I do.

MR. TULLY: USAir 1016 was not on the frequency at that time, correct?

THE WITNESS: Correct.

MR. TULLY: So at least at the time of 2240 and 01, you had available to you RVR information?

THE WITNESS: Correct.

MR. TULLY: Do you know if they had that

information in the tower?

THE WITNESS: They have an RVR display in the tower, yes.

MR. TULLY: Do you know if the RVR equipment in the tower was turned on simultaneously with your equipment?

THE WITNESS: No, I don't.

MR. TULLY: Are there any general procedures in place at your facility which assists you in receiving timely weather information, which you then can pass on to flight crews? Is there anything formal or informal within your facility to ensure that you receive timely information on weather that you can then pass on to flight crews?

THE WITNESS: Well, we get the print-out from the National Weather Service, and that comes out on an hourly basis normally. And if there's some significant weather, they send out a special.

MR. TULLY: I'm talking about intra-facility. In other words, if the tower personnel were making visual observations -- and I presume that some of the controllers up there have -- are certified weather observers?

THE WITNESS: Yes.

MR. TULLY: If they were observing conditions changing rapidly, is there any procedure within your facility to have them communicate that information down to you; or is this just done informally?

THE WITNESS: It's normally done via the telephone communication lines, the inter-line system.

MR. TULLY: The various transcripts, the various ATC transcripts of the conversation that goes on within the facility has the local controller east reporting rain, heavy rain on the airport. There is a cab -- a supervisor controller who turns generators on. He makes a comment, "Going to go IMC. Very quickly raining very hard."

There is apparently knowledge in the tower that the situation is decreasing -- the weather picture is decreasing rapidly at the airport.

THE WITNESS: Right.

MR. TULLY: Were you ever advised of that in any way prior to receiving the information that the visibility was now at one mile?

THE WITNESS: No, I wasn't.

MR. TULLY: So you're not privy to that kind

of inter-facility --

THE WITNESS: I didn't receive any.

MR. TULLY: Okay. I have no more questions. Thank you very much.

THE WITNESS: You're welcome.

CHAIRMAN HAMMERSCHMIDT: Thank you, Captain Tully. USAir.

MR. SHARP: I don't have any questions.

CHAIRMAN HAMMERSCHMIDT: No questions. Thank you. Okay. McDonnell-Douglas.

MR. LUND: No questions, Mr. Chairman. Thank you.

CHAIRMAN HAMMERSCHMIDT: Thank you. Let's see. International Association of Machinists. No questions.

Association of Flight Attendants.

MS. GILMER: Thank you, Mr. Chairman. We don't have any questions.

CHAIRMAN HAMMERSCHMIDT: Thank you. Dispatchers Union.

MR. SCHUETZ: Mr. Chairman, no questions.

CHAIRMAN HAMMERSCHMIDT: Pratt and Whitney.

MR. YOUNG: No questions, Mr. Chairman.

CHAIRMAN HAMMERSCHMIDT: National Weather Service.

MR. KUESSNER: No questions.

CHAIRMAN HAMMERSCHMIDT: Federal Aviation Administration.

MR. DONNER: Are there any major differences in the radar display to you, the controller, from the ASR-9 compared to the ASR-4?

THE WITNESS: None.

MR. DONNER: You talked about levels. When we're talking levels and we're talking weather, can you tell us what your understanding of what those levels mean; what is it measuring?

THE WITNESS: Precipitation.

MR. DONNER: Is there a way to determine a thunder storm on your ASR-9 radar?

THE WITNESS: No.

MR. DONNER: You mentioned the fact that a level 4 was available at one time during that evening. Could you say a little more about what available means to you?

THE WITNESS: Available means that it is detected in the approach control air space.

MR. DONNER: Would that necessarily be in your air space?

THE WITNESS: No, sir.

MR. DONNER: Is it your understanding that the examples given in your handbook are equivalent to requirements?

THE WITNESS: I'm sorry. I don't understand.

MR. DONNER: I'll clarify that. If you're given an example of phraseology that says you are to use the words, level 4 or level 3, is that a mandatory requirement to do that; or is that an example or recommendation?

THE WITNESS: It's an example. It's an example. It says example.

MR. DONNER: In your various duties as a controller, what takes first priority?

THE WITNESS: Separation of aircraft.

MR. DONNER: Where does weather dissemination fit into your priorities?

THE WITNESS: Additional duties.

MR. DONNER: Why is that?

THE WITNESS: Because separation of aircraft is paramount. Safety alert is second.

MR. DONNER: Thank you very much. No further questions.

CHAIRMAN HAMMERSCHMIDT: Thank you, Mr. Donner. Mr. Feith, do you have a question?

MR. FEITH: I just have a few questions. You had described the development of weather that you observed on the ASR-9. Can you just describe how you knew that that was developing? Did you watch an area expand since your measuring precipitation? Can you just elaborate on that?

THE WITNESS: I didn't see any area expand, because of where it was. It was -- it's just basically -- like I said in my interviews, it popped up. It like showed up right there.

MR. FEITH: In relating the fact that your supervisor came by and informed you that the tower visibility had gone down to a mile --

THE WITNESS: Yes, sir.

MR. FEITH: -- did he provide any explanation as to why the visibility reduced? Was it because of rain or was it because of dust?

THE WITNESS: No, he didn't. He didn't say.

MR. FEITH: He just said that it had reduced

to one mile?

THE WITNESS: Yes.

MR. FEITH: Did you -- when he informed you of the visibility going down, did you correlate that with the developing weather?

THE WITNESS: Just through experience, yes.

MR. FEITH: No further questions. Thank you.

CHAIRMAN HAMMERSCHMIDT: Mr. Salottolo.

MR. SALOTTOLO: Just a few. Mr. Masi, the ASR-9 presentation that you were observing prior to and up to the time of the accident or subsequent to the accident, was it two levels, two gray shades or three gray shades and a black shade? What exactly? I'm a little confused.

THE WITNESS: I think you're trying to ask -- what you're trying to ask is what did I have selected. I had level 1 and 3 selected. And level 1 would show up as a very light shade of green. Level 3 would show up as my dark shade of green. And if there was a level 2 in there, it would show up as a blank space on my scope. And I did not see 1 or 2. I just saw the level 3.

MR. SALOTTOLO: I think you testified that

you -- subsequent to the accident, you saw a level 4?

THE WITNESS: Subsequent. It was after the accident.

MR. SALOTTOLO: After the accident, a level 4.

THE WITNESS: Yes.

MR. SALOTTOLO: And that was -- you didn't know where that was located? It was just somewhere in the air space?

THE WITNESS: It could have been in the air space -- anywhere in the air space, but I didn't see it on my scope.

MR. SALOTTOLO: But it could have been on -- would it have shown on your scope if it was?

THE WITNESS: Yes, sir.

MR. SALOTTOLO: How would that have shown if you were just showing 1 and 3?

THE WITNESS: I would have to physically reach up and select level 4, which I did and it did not show up on my scope.

MR. SALOTTOLO: So, in other words, you went to the screen looking for 4 and it just didn't show up?

THE WITNESS: Exactly.

MR. SALOTTOLO: You mentioned that the weather echo was on the final approach, the final approach to 18 right?

THE WITNESS: Yes, sir.

MR. SALOTTOLO: The RVR oral alarm, you mentioned; what was that set on?

THE WITNESS: I don't know.

MR. SALOTTOLO: No further questions.

CHAIRMAN HAMMERSCHMIDT: Thank you. Mr. Laynor.

MR. LAYNOR: No questions.

CHAIRMAN HAMMERSCHMIDT: Mr. Clark.

MR. CLARK: Mr. Masi, you indicated that you saw the weather on the north end of the field, the approach into the runway.

THE WITNESS: Yes.

MR. CLARK: And you saw no weather to the south. Is that because of the cone of silence or --

THE WITNESS: I believe so, yes.

MR. CLARK: How big is the cone of silence, what size radius?

THE WITNESS: I don't know.

MR. CLARK: Does it -- if you had weather at

the south end, at the approach end from the south, would you see weather there, or have you seen weather there in the past?

THE WITNESS: Yes, I have.

MR. CLARK: Just like you can see weather near the approach end on the north side?

THE WITNESS: I guess.

MR. CLARK: Then the ASR-9s are located approximately?

THE WITNESS: A mile from the control tower.

MR. CLARK: Where relative to either end of the runway?

THE WITNESS: It's approximately mid field.

MR. CLARK: Mid field.

THE WITNESS: Yes.

MR. CLARK: So we're looking -- the radius is roughly something less than the half length of the runway? Or the diameter of the cone of confusion is less?

THE WITNESS: Approximately.

MR. CLARK: Then you saw no other weather further south outside of that cone of confusion?

THE WITNESS: I don't remember noticing any

weather south.

MR. CLARK: And then you saw no other weather further south outside of that cone of confusion?

THE WITNESS: I don't remember noticing any weather south.

MR. CLARK: Nothing caught your eye that you remember?

THE WITNESS: The only thing that did catch my eye was when it popped up just north.

MR. CLARK: Did it -- is it -- did it appear to be coming out of the cone of silence or you just saw the --

THE WITNESS: As a matter of fact, that's exactly how it appeared to me at the time. It popped up so quickly, that's how it appeared. Like it moved out of the cone of silence. It showed up on my scope.

MR. CLARK: Thank you.

THE WITNESS: You're welcome.

CHAIRMAN HAMMERSCHMIDT: Let's see. Ms. Simpson, do you have another questions?

MS. SIMPSON: Yes, just a couple more. In your view, do the intensity levels have any correlation to the weather that is depicted on the ASR-9?

THE WITNESS: I'm sorry. Say that again, please.

MS. SIMPSON: Does the VIP intensity -- the intensity that you are displaying, does it have any correlation to the weather that is depicted?

THE WITNESS: I don't know. I don't understand your questions.

MS. SIMPSON: The weather conditions, do they correlate to the levels?

THE WITNESS: It correlates, yes. I believe -- I'm trying to -- I really don't understand what you're trying to ask me.

MS. SIMPSON: You say that you see a level 1 -- a level 3 popped up.

THE WITNESS: Yes.

MS. SIMPSON: What kind of weather conditions correlate with a level 3?

THE WITNESS: Heavy precipitation.

MS. SIMPSON: Do you correlate a thunderstorm activity with a level 3?

THE WITNESS: It's possible.

MS. SIMPSON: Do you correlate?

THE WITNESS: No, not all of the time.

MS. SIMPSON: On the night of the accident and with your light work load and light complexity, did this allow you time to perform additional duties?

THE WITNESS: Yes.

MS. SIMPSON: Would one of those duties be issuing weather information?

THE WITNESS: Yes, which I did issue. I issued the weather to the pilot. That's why I changed him from the visual to the instrument approach.

MS. SIMPSON: Thank you.

CHAIRMAN HAMMERSCHMIDT: Thank you, Ms. Simpson. You asked a question which leads into one that I was going to ask. Mr. Masi, can you define for those here in this room who may not be that familiar with weather terminology -- could you what the different VIP levels are from 1 through 6?

THE WITNESS: Quickly, level 1 is very light precipitation. Level 2 is moderate precipitation. Level 3 would be heavy. Level 4 would be -- I think it goes extreme. Level 5 is intense and Level 6 is very intense and extreme, associated with hail and level 6.

CHAIRMAN HAMMERSCHMIDT: I thought that might be helpful for many here. Mr. Schleede.

MR. SCHLEEDE: I guess there are a couple of clarification areas. Regarding your testimony about the handbook phraseology examples on how to disseminate weather information, did I understand that you give OJT? You are an OJT instructor?

THE WITNESS: Yes, sir.

MR. SCHLEEDE: During OJT, when you're giving OJT, would you expect the controller, the trainee, to follow the guidance in the handbook, the phraseology guidance?

THE WITNESS: Yes, absolutely.

MR. SCHLEEDE: How much deviation from that would you permit as an instructor?

THE WITNESS: When I'm instructing someone, I don't give anybody any leeway in that.

MR. SCHLEEDE: How bout if you are doing the controlling, does your supervisor expect you to follow the examples in the guidance, the phraseology guidance?

THE WITNESS: Yes, he does.

MR. SCHLEEDE: The last area is, since the accident, are you aware of any changes to policies or procedures for the use of the ASR-9 radar --

THE WITNESS: No.

MR. SCHLEEDE: -- for weather dissemination?

THE WITNESS: No, I'm not.

MR. SCHLEEDE: No written guidance, no oral changes to policies and procedures?

THE WITNESS: I don't recall any.

MR. SCHLEEDE: Thank you. That's all I have.

CHAIRMAN HAMMERSCHMIDT: Mr. Masi, is there anything additional you would like to add for the record?

THE WITNESS: No, sir.

CHAIRMAN HAMMERSCHMIDT: Thank you very much. You may stand down.

THE WITNESS: You're welcome.

(Witness excused.)

CHAIRMAN HAMMERSCHMIDT: I believe let's take a ten-minute break. Try to keep it to ten minutes. And we will reconvene with the next witness, Mr. Jeffrey Vincent.

(Brief recess.)

CHAIRMAN HAMMERSCHMIDT: Let's reconvene the hearing, please. It looks obvious from the time frame and the fact that we have to vacate the room by 5:00 this afternoon, that we will just be able to question

one additional witness.

So that will be witness number four, Mr. Jeffrey Vincent. Will you please come forward?

Mr. Vincent will be questioned by Mr. Salottolo and Ms. Simpson.

JEFFREY VINCENT, LOCAL CONTROL WEST CONTROLLER, CHARLOTTE CONTROL TOWER, CHARLOTTE, NORTH CAROLINA

Whereupon,

JEFFREY VINCENT,

having been first duly sworn was called as a witness herein and testified as follows:

MR. SCHLEEDE: Mr. Vincent, could we have your full name and business address, please?

THE WITNESS: Jeffrey Andre Vincent, Charlotte tower.

MR. SCHLEEDE: By whom are you employed?

THE WITNESS: Federal Aviation Administration.

MR. SCHLEEDE: As an air traffic controller?

THE WITNESS: Yes.

MR. SCHLEEDE: How long have you been an air traffic controller with the FAA?

THE WITNESS: Since 1970.

MR. SCHLEEDE: Could you move the mic a little closer? Could you briefly describe your education and experience that qualifies you for your position?

THE WITNESS: I spent two years and ten months as a radar air traffic controller in the United States Army. And I started at Boston Logan as a

controller in '87, and spent six years there and then came to Charlotte.

MR. SCHLEEDE: Do you hold any FAA ratings or certificates as a pilot?

THE WITNESS: No.

MR. SCHLEEDE: Thank you. Ms. Simpson will proceed. Thank you.

MS. SIMPSON: Mr. Vincent, at the time of the accident, you were assigned to a local control west position. Briefly describe your duties and responsibilities at that position.

THE WITNESS: As a local west controller, I am responsible for aircraft landing and departing runway 18 right.

MS. SIMPSON: Prior to and at the time of the accident, briefly describe your work load and the complexity.

THE WITNESS: I'd say work load was moderate. Complexity was routine.

MS. SIMPSON: What is routine?

THE WITNESS: Not difficult.

MS. SIMPSON: At the time of the accident, about how many aircraft were you responsible for?

THE WITNESS: As I recall, I think I had two aircraft that were holding short, three aircraft on my frequency that were landing. So I would say approximately five. I cannot be sure.

MS. SIMPSON: Two aircraft holding short, two aircraft arriving and plus the accident?

THE WITNESS: Three aircraft arriving.

MS. SIMPSON: Oh, three aircraft. I'm sorry. Were you standing or sitting while you were working that position?

THE WITNESS: I do not recall.

MS. SIMPSON: At a local west position, what direction do you face?

THE WITNESS: I would be facing south.

MS. SIMPSON: So you would be looking directly at 18 right?

THE WITNESS: Looking out the window, standing straight, looking straight ahead, I would be facing south. I would have to turn to look at the approach of runway 18 right.

MS. SIMPSON: Were you wearing a headset?

THE WITNESS: Yes.

MS. SIMPSON: What frequencies were you

monitoring?

THE WITNESS: It was 126.4.

MS. SIMPSON: What frequency was that?

THE WITNESS: The local control west frequency.

MS. SIMPSON: As a local control west controller, describe of how you keep track of arrival and departure aircraft?

THE WITNESS: Departure aircraft taxies out to the runway. I look at the call sign as written on the flight progress strip. And I generally write the call sign down on a pad. The arriving aircraft are displayed on the D-BRITE display. And I generally write down arriving aircraft on a pad.

MS. SIMPSON: On the same pad?

THE WITNESS: Yes.

MS. SIMPSON: Do you have certain columns for each one?

THE WITNESS: Yes. There is a column for arriving aircraft, a column for departure aircraft.

MS. SIMPSON: Prior to the accident, did you feel comfortable working that position, or did you feel you needed any assistance?

THE WITNESS: I felt comfortable.

MS. SIMPSON: Prior to the accident, was weather having any effect on airport operations?

THE WITNESS: As? Could you be more specific?

MS. SIMPSON: Did you have any detours? Did you have anything special that you had to do for any aircraft that were departing or arriving, any special coordination that you needed to do at the approach control regarding any of your aircraft?

THE WITNESS: Prior to the accident, the only thing that I recall was an aircraft that circled from runway 23 to runway 18 right. The reason for that circle, I do not know. I don't know if it was caused by weather.

MS. SIMPSON: And the two aircraft that you had holding, why were they holding?

THE WITNESS: Neither aircraft wanted to depart at the time.

MS. SIMPSON: And do you know why that was?

THE WITNESS: No, I don't.

MS. SIMPSON: While you were on position near the time of the accident, describe the weather

conditions.

THE WITNESS: As I recall, it started to rain to the south. I saw some rain at runway 23. I observed a sale between runway 18 left and runway 23.

MS. SIMPSON: Was there any movement of that rain?

THE WITNESS: As I recall, it started to rain south of the airport first, so I would say, yes, the rain did move.

MS. SIMPSON: What was the intensity of that rain?

THE WITNESS: It was just some general rain shower. I had good visibility when the rain began. I could see.

MS. SIMPSON: Could you see throughout that rain shower?

THE WITNESS: Excuse me?

MS. SIMPSON: Could you see throughout the duration of that rain shower?

THE WITNESS: No, I cannot.

MS. SIMPSON: Prior to the accident, did you see any lightning?

THE WITNESS: I do not recall.

MS. SIMPSON: Did you hear any thunder?

THE WITNESS: I do not recall any.

MS. SIMPSON: How did the rain or did the rain affect your ability to see aircraft?

THE WITNESS: Shortly before the accident during my scan period, I was looking out the window, and I noticed that the approach to runway 18 right threshold had become partially obscured. I do not know if that observation came from rain or low clouds.

MS. SIMPSON: Did you advise anyone that 18 right was partially obscured, either pilots or controllers?

THE WITNESS: No, I did not.

MS. SIMPSON: Why not?

THE WITNESS: At the time when I noticed the approach into runway 18 right, it started to become partially obscure. Shortly after USAir 1016 stated it was going around, I got busy with the go-around procedures.

MS. SIMPSON: At about this time when the aircraft was going around, the two aircraft that were holding, were you able to see them?

THE WITNESS: I don't recall.

MS. SIMPSON: Are you certified to take visibility observations?

THE WITNESS: Yes.

MS. SIMPSON: What is your definition of prevailing visibility?

THE WITNESS: The greatest distance I could see throughout one-half of the arrival.

MS. SIMPSON: What is obscuring phenomenon?

THE WITNESS: As referring to what?

MS. SIMPSON: Just visibility.

THE WITNESS: As referring to the approach into runway 18 right, obscure phenomenon was I couldn't see it. I just -- it was just partially obscured.

MS. SIMPSON: By what?

THE WITNESS: Either rain or clouds.

MS. SIMPSON: Is that heavy rain, light rain? Can you describe the rain?

THE WITNESS: I would say it was heavy rain.

MS. SIMPSON: Prior to and at the time of the accident, do you have an opinion on what the prevailing visibility was?

THE WITNESS: No.

MS. SIMPSON: If I gave you a visibility

chart, could you tell us about what you could see and what you couldn't see at the time of the accident?

THE WITNESS: Actually, I don't recall. I remember being able to look south of the airport. Exactly what I saw at that time, I don't recall.

MS. SIMPSON: Could you see the approach end of 18 right at the time of the accident?

THE WITNESS: I could not see the runway threshold clearly to runway 18 right at the time of the accident.

MS. SIMPSON: Approximately how far is 18 right from the tower?

THE WITNESS: I'm not exactly sure without looking at a chart. I'm not sure.

MS. SIMPSON: Can we refer to Exhibit 3-D, please?

THE WITNESS: Three-B?

MS. SIMPSON: Three-D, Delta. It's labeled, "The Visibility Charts," page 1. Do you have it there? Do you have it?

THE WITNESS: Yes.

MS. SIMPSON: Could you see the city of Charlotte?

THE WITNESS: I don't recall.

MS. SIMPSON: How about the approach end to runway 5?

THE WITNESS: I don't -- honestly, I don't recall.

MS. SIMPSON: When did you first become aware of USAir Flight 1016?

THE WITNESS: When they checked in on my frequency.

MS. SIMPSON: What do you recall about that flight and the subsequent accident?

THE WITNESS: I checked on the frequency. I issued a landing clearance. I received a wind shear alert, issued a wind shear alert. The aircraft stated it was going around. And I asked him to confirm you're turning right. And subsequently I called him several times with no response.

MS. SIMPSON: When did you first see the radar target?

THE WITNESS: I don't recall the exact mileage.

MS. SIMPSON: I'm sorry?

THE WITNESS: I do not recall the exact

mileage the aircraft was at when he checked in on my frequency.

MS. SIMPSON: Is there a normal location that the aircraft check in on an ILS approach?

THE WITNESS: Yes.

MS. SIMPSON: Where was that?

THE WITNESS: Excuse me. Maybe I misunderstood your first question.

MS. SIMPSON: No. Normally. Normally there is a spot?

THE WITNESS: I'm sorry. I did not hear you, ma'am.

MS. SIMPSON: You said you don't recall the exact mileage when you first saw the radar target; is that correct?

THE WITNESS: No. I do not -- no, I do not recall the exact mileage he was at when he checked in on the frequency, no.

MS. SIMPSON: Where was the aircraft when you first saw him on the BRITE radar?

THE WITNESS: He was established on the final for runway 18 right.

MS. SIMPSON: What mileage?

THE WITNESS: I don't recall.

MS. SIMPSON: Do you recall the full data block? Was there a full data block on the aircraft?

THE WITNESS: I don't exactly remember, but there wasn't anything unusual about the data block that I remember. Normally there is a full data block. I don't remember anything missing from this data block.

MS. SIMPSON: Do you recall any of the specific information contained in that data block?

THE WITNESS: No.

MS. SIMPSON: Where was the radar target when you last saw it on the D-BRITE?

THE WITNESS: The contract was short and final. The exact mileage I do not recall.

MS. SIMPSON: What is short final?

THE WITNESS: I would say short final would be two miles or less to the runway. That's my own personal term of short final.

MS. SIMPSON: What altitude was displayed when you last saw the aircraft?

THE WITNESS: I don't recall.

MS. SIMPSON: When you could no longer see a radar target on the D-BRITE, did that come to you as a

surprise?

THE WITNESS: Yes.

MS. SIMPSON: Why is that?

THE WITNESS: Because I was calling the aircraft. The aircraft wasn't responding. I did not see a target, when the target dropped off, as normally a target would drop off when an aircraft lands when he is short and final. I was waiting for the target to reacquire, which is normal on the go-around procedure. And the target did not reacquire, and I did not see a primary radar target. And I was calling the aircraft. Yes, I was surprised.

MS. SIMPSON: You said that your definition of short final is two miles. Is that normally when a radar target drops off the D-BRITE?

THE WITNESS: No. I said an aircraft short and final to me is when an aircraft is two miles or less from the runway.

MS. SIMPSON: After there was no longer a radar target displayed on the D-BRITE, did you acquire visual contact with that airplane?

THE WITNESS: No.

MS. SIMPSON: Why not?

THE WITNESS: Why I didn't see the aircraft?

MS. SIMPSON: Correct.

THE WITNESS: Because my visibility was obscured to the west.

MS. SIMPSON: What was limiting your visibility to the west?

THE WITNESS: Either rain or clouds.

MS. SIMPSON: If the rain or the clouds was limiting your visibility -- I'm sorry, your ability to visually acquire the aircraft, should you have advised the pilot of this fact?

THE WITNESS: When I noticed -- as I stated earlier, when I noticed that the rain had intensified and my visibility was being restricted by clouds, the aircraft shortly stated he was going around.

MS. SIMPSON: When was the last time you had a chance to review the transcript?

THE WITNESS: Probably yesterday.

MS. SIMPSON: According to the transcript, at 2239:12, you had a conversation with the flight crew of USAir 806. That was one of the aircraft that was holding for departure. And the flight crew stated, "And 806, looks like we've got a storm right on top of

the field there."

And you replied, "USAir 806, affirmative."

Do you remember that?

THE WITNESS: Yes. What number is the transcript, please?

MS. SIMPSON: Well, that's 3-B, page 4. Got it?

THE WITNESS: Yes, ma'am.

MS. SIMPSON: Okay. What indications did you have that there was a storm on top of the field?

THE WITNESS: At that time, I saw rain to the south of the airport, to the east of the airport. And I also observed the cell, but that was between runway 18 left and runway 23.

MS. SIMPSON: Okay. You said you saw rain south and east of the field. How hard was it raining?

THE WITNESS: I wouldn't say it was very hard. I still had good visibility.

MS. SIMPSON: What could you sese with that good visibility?

THE WITNESS: I do recall seeing the FBO ramp.

MS. SIMPSON: The what?

THE WITNESS: The FBO ramp. The general aviation ramp.

MS. SIMPSON: Would you say there was still six miles?

THE WITNESS: I don't know.

MS. SIMPSON: Did you see any lightning?

THE WITNESS: I don't recall that.

MS. SIMPSON: Did you hear any thunder?

THE WITNESS: I don't recall any.

MS. SIMPSON: In the load, you said you saw a cell on 18 left and runway 23?

THE WITNESS: Yes. The cell appeared between 18 left and runway 23.

MS. SIMPSON: Was that from the D-BRITE or was that just visually out the window?

THE WITNESS: That was from what I saw on the D-BRITE.

MS. SIMPSON: What intensity or what level would you say that this was at?

THE WITNESS: I'm not sure what level the weather channel. I don't remember what it was set at.

MS. SIMPSON: Do you know what was available at that time?

THE WITNESS: No, I do not.

MS. SIMPSON: In your opinion -- disregard. When working the local control position, what is your criteria for determining what type of weather and when that weather information should be disseminated to aircraft?

THE WITNESS: If I receive a special weather or there is an aid that's changed, then I will inform the aircraft.

MS. SIMPSON: What about personal observations that you've made?

THE WITNESS: If I think that it will impact his route of flight.

MS. SIMPSON: Did you tell USAir 1016 that there was a storm on top of the field?

THE WITNESS: No, I did not.

MS. SIMPSON: Why did you elect not to?

THE WITNESS: Because at the time that USAir 1016 checked in on my frequency, the weather was not impacting runway 18 right. As I stated earlier, an aircraft had circled from runway 23 and landed runway 18 right in front of USAir 1016.

MS. SIMPSON: Had the weather conditions

changed between that time the aircraft landed on the circling approach and the time that USAir 1016 came in for his approach?

THE WITNESS: After the aircraft that circled landed issued that arrive report, I issued that arrive report to USAir 1016, I then was scanning my D-BRITE. I think I also received wind shear alert between that time. I was doing other duties. I wasn't exactly staring out the window. And as I scanned, scanned my straight up, scanned my D-BRITE, looking out the window -- it was when I looked back out the window and I noticed that runway 18 right threshold had become partially obscured.

MS. SIMPSON: I'd like to refer you now to the Air Traffic Bulletin, Bulletin Number 94-1, February 1994, Exhibit 3-H.

THE WITNESS: What Exhibit would that be?

MS. SIMPSON: It's 3-Hotel, 3-H. Do you have it?

THE WITNESS: Yes.

MS. SIMPSON: Are you familiar with the Air Traffic Bulletins?

THE WITNESS: Yes.

MS. SIMPSON: As a controller, how do you receive this information?

THE WITNESS: During team briefings.

MS. SIMPSON: And how are your team briefs conducted?

THE WITNESS: It's conducted by the supervisor.

MS. SIMPSON: Do basically you all sit in a room and he reads something to you; or does he give you a manual to read and you read it? What do you do?

THE WITNESS: Basically if you're in the briefing, he reads the information to you.

MS. SIMPSON: And if you look at page 1 of this Exhibit, can you briefly describe the contents of this page? It's the very first page. Briefing title. It starts with briefing title.

CHAIRMAN HAMMERSCHMIDT: The one that's numbered 401.

MS. SIMPSON: Correct.

THE WITNESS: I would say the -- yes, thank you, sir.

CHAIRMAN HAMMERSCHMIDT: You've got it?

THE WITNESS: Yes.

MS. SIMPSON: It's the one in front of that, I believe.

THE WITNESS: This would be the number of the teams and the initials of the controllers.

MS. SIMPSON: Are you represented on this page?

THE WITNESS: Yes, I am.

MS. SIMPSON: Where are you located?

THE WITNESS: I would be the third column down, far right, initials Victor-Tango, VT.

MS. SIMPSON: What does 33194 next to your name represent?

THE WITNESS: It means I received this briefing on 3-31-94.

MS. SIMPSON: Can we look at page 6 of this document? It gives suggestions for pilots regarding flying into storm conditions. It's under the do's and the don'ts of thunderstorm that's on the first column on the left side?

The first "don't" states, "Don't land or take off in the face of an approaching thunderstorm, A sudden wind shift or low level turbulence could cause loss of control."

Were you briefed on this portion of the document?

THE WITNESS: I cannot recall the entire document.

MS. SIMPSON: But you were briefed on Bulletin 94-1?

THE WITNESS: Yes. I was briefed on the bulletin.

MS. SIMPSON: With this comment in mind, do you believe that the flight crew of USAir 1016 should have been advised of the weather conditions on the airport?

THE WITNESS: At the time of -- at the time, I did not see anything that was obstructing runway 18 right.

MS. SIMPSON: In your training records, it states that you were certified on the operation of the LLWAS during July of 1992. What does the certification process entail?

THE WITNESS: I don't exactly recall. I'm sure it's part of my classroom training.

MS. SIMPSON: What was the training -- what did the training consist of?

THE WITNESS: I remember during my initial tower training class when I came on board at Charlotte in 1992, that that was a portion of class that covered LLWAS.

MS. SIMPSON: What about hands-on training, did you receive any of that?

THE WITNESS: I knew how to -- the OJT, I knew how the LLWAS worked.

MS. SIMPSON: Can you explain how the different sensors are labeled on the LLWAS?

THE WITNESS: With C for center field, NE meaning northeast, SW meaning southwest and so forth.

MS. SIMPSON: So basically there are no numbers to tell you which sensor is indicating what?

THE WITNESS: No. There are no numbers.

MS. SIMPSON: So is it possible to issue the wrong boundary wind information when you're issuing wind shear?

THE WITNESS: Excuse me?

MS. SIMPSON: Is there any way to issue the wrong boundary wind when you're issuing a wind shear alert?

THE WITNESS: No. I issue the sensor that is

flashing. When I get an alert, I am alerted by an oral alarm and also by the flashing of the boundary that is in the alarm. So the boundary that I see flashing, I look for the corresponding letters beside it. And that's what I will issue.

MS. SIMPSON: And since you've been at the Charlotte facility, have you experienced any problems with the LLWAS?

THE WITNESS: Personally, no.

MS. SIMPSON: Have you ever filed a UCR in the LLWAS?

THE WITNESS: No, I have not.

MS. SIMPSON: The night of the accident, did you notice any problems with the LLWAS?

THE WITNESS: No, I did not.

MS. SIMPSON: Was the LLWAS -- or do you know to the best of your knowledge, was the LLWAS out of service any time during your shift prior to the accident?

THE WITNESS: To the best of my knowledge, it was not.

MS. SIMPSON: According to the ATC transcript at 2240:50, you issued the wind as 100 at 19. And

approximately six seconds later, you issued the wind again as 110 at 21. What prompted you to issue the wind so quickly just six seconds later?

THE WITNESS: I think I was probably still staring at the display when it changed, when I noticed it changed.

MS. SIMPSON: Were any of the sensors flashing?

THE WITNESS: At that time, not that I recall.

MS. SIMPSON: I'm going to move on to the RVR. Is there an RVR read-out panel located at the local west position?

THE WITNESS: Yes, it is.

MS. SIMPSON: Do your duties and responsibilities as a local controller require you to activate and issue the RVR information?

THE WITNESS: It requires me to issue the RVR information.

MS. SIMPSON: Who is required to activate it?

THE WITNESS: That would be a requirement of the person that's in charge of the tower.

MS. SIMPSON: What is your understanding of

when the RVR should be issued?

THE WITNESS: The RVR should be issued when the prevailing visibility is one mile or less or RVR is of reportable value.

MS. SIMPSON: So you wait until someone comes over to your position to activate the RVR before you will issue it?

THE WITNESS: That would be really speculating. I can't say that I would do that. If someone told me to turn on the RVR, I would turn on the RVR.

MS. SIMPSON: Would you turn on the RVR of your own volition?

THE WITNESS: I would only be speculating.

MS. SIMPSON: Have you in the past?

THE WITNESS: Yes, I have turned an RVR on.

MS. SIMPSON: The tower reported the tower visibility as one mile. Did you issue the RVR to the flight crew of USAir 1016?

THE WITNESS: I was not aware that the visibility was one mile.

MS. SIMPSON: How would you become aware that the visibility was one mile?

THE WITNESS: If I had been told it was special weather or if the supervisor would tell me the tower visibility is not one mile. Then I would know.

MS. SIMPSON: And the fact that you could not see the approach end of runway 18 right did not indicate that you could not see one mile?

THE WITNESS: As I stated earlier, ma'am, I could -- I had good visibility when USAir 983 circled from runway 23 to land. I saw the aircraft. And I think it was within one minute and 35 seconds that USAir 1016 stated that it was going around. I was scanning and doing other duties when I looked back out the window and I noticed that the approach into runway 18 right had become obscure. The aircraft shortly stated he was going around. It was a matter of seconds.

MS. SIMPSON: To the best of your knowledge, is there any reference in the 7110.65 when to turn on the RVR?

THE WITNESS: No.

MS. SIMPSON: Is there any reference in the facilities operations or administrative handbook that you are aware of that specifies when to turn on the

RVR?

THE WITNESS: No.

MS. SIMPSON: To the best of your knowledge, are there any local directives or orders, notices, or memorandums which specify when to turn on the RVR?

THE WITNESS: No.

MS. SIMPSON: Does the local control west position have a position binder?

THE WITNESS: Yes.

MS. SIMPSON: What type of information is contained in that binder?

THE WITNESS: Duties and responsibilities of the local west.

MS. SIMPSON: Where is that located?

THE WITNESS: I think it would be at the clearance delivery position. I'm not exactly sure.

MS. SIMPSON: So the position (sic) for the local west position is not at the position itself?

THE WITNESS: No.

MS. SIMPSON: Do you have easy access to that binder?

THE WITNESS: Yes.

MS. SIMPSON: Is there any reference in that

position binder when to turn on the RVR?

THE WITNESS: Not that I can recall.

MS. SIMPSON: And you indicated that you are supposed to issue the RVR if the prevailing visibility is one mile or less or there is a reportable value. Is that correct?

THE WITNESS: That's correct.

MS. SIMPSON: Is there any way to know if there is an RVR reading without turning on the equipment?

THE WITNESS: No.

MS. SIMPSON: And as a result of this accident, did you receive any remedial training?

THE WITNESS: No, I did not.

MS. SIMPSON: Thank you. I have no further questions.

CHAIRMAN HAMMERSCHMIDT: Thank you, Ms. Simpson. Going to the parties -- let's see. Does anyone else on the tech panel have any questions before I go to the parties? Mr. Salottolo.

MR. SALOTTOLO: Yes, Mr. Chairman. I have a few.

CHAIRMAN HAMMERSCHMIDT: Thank you.

MR. SALOTTOLO: Mr. Vincent, you testified that you saw a cell on the D-BRITE.

THE WITNESS: Yes.

MR. SALOTTOLO: And then you said you weren't sure what the intensity was?

THE WITNESS: That's correct.

MR. SALOTTOLO: Because you weren't sure what the intensity levels were set at?

THE WITNESS: I was not sure what -- weather -- what channels were selected on the weather. What levels were selected, I wasn't sure.

MR. SALOTTOLO: What levels. Is that something that's available in the tower or would you normally be aware of what; or can you avail yourself of the information to make the determination as to what the level is in the tower? Or how does that work?

THE WITNESS: The selector sits between the two ground control positions, ground control east and ground control west.

MR. SALOTTOLO: So it is in the tower. It's just a question that you weren't aware of?

THE WITNESS: Yes, it is in the tower.

MR. SALOTTOLO: Okay. When did you become

aware that a thunderstorm was at the field, reported for the field?

THE WITNESS: Well, I don't know if I would exactly say it was a thunderstorm. What I saw was rain. That's what I recall seeing is rain. If you're referring to the transcript, when 806 asks if there is a thunderstorm on the field and I said, affirmative, what I saw was rain.

MR. SALOTTOLO: So you were never at any time aware that a thunderstorm, or nobody indicated to you that a thunderstorm was in progress at the field?

THE WITNESS: No. I don't recall hearing thunder, or I don't recall seeing lightning.

MR. SALOTTOLO: You also testified that you're certified to make visibility observations?

THE WITNESS: Yes. If I'm serving as a CIC, then I can make the official visibility call.

MR. SALOTTOLO: But you weren't responsible for that function?

THE WITNESS: No. I was not acting in that capacity.

MR. SALOTTOLO: No further questions. Thank you.

CHAIRMAN HAMMERSCHMIDT: Thank you, Mr. Salottolo. Let's see. Now going to the parties, the National Air Traffic Controllers Association.

MR. PARHAM: Vince, does ASR-9 accurately depict developing weather from your experience? In other words, what you see on the ASR-9, can you correlate that with your experience in the tower and seeing it develop? Does it always accurately depict what is happening?

THE WITNESS: I have no recollection. I mean, there are times when pilots deviate around something that I do not see on the D-BRITE.

MR. PARHAM: Referring back to 3-D, the visibility chart? On the five-mile chart and the one-mile chart, is the threshold for 18 right one of the distance checks for determining visibility?

THE WITNESS: Not that I see.

MR. PARHAM: So there is no need for you to really know what the distance from the tower to the threshold of 18 right?

THE WITNESS: No, there is not.

MR. PARHAM: Are you certified to determine what the restrictions to visibility would be?

THE WITNESS: No, I am not

MR. PARHAM: When you take a -- you said you were qualified to take visibility checks; is that correct?

THE WITNESS: That's correct.

MR. PARHAM: When you take a visibility check, are you required to issue a restriction of that visibility?

THE WITNESS: No, I am not.

MR. PARHAM: Referring back to the weather that was developing, based on your experience and the questions that were asked by USAir 1016, do you feel that he saw or knew that the weather was out there?

THE WITNESS: Yes, I do.

MR. PARHAM: Are you familiar with the phrase, "critical phase of flight"?

THE WITNESS: Yes, I am.

MR. PARHAM: What does that mean?

THE WITNESS: When the aircraft is taking off or landing, that is the most critical phases of flight.

MR. PARHAM: Have you been trained to limit your communications to aircraft in the critical phase of flight?

THE WITNESS: Yes, I have.

MR. PARHAM: As a controller at Charlotte, are you allowed to withhold a take-off or landing clearance to an aircraft based on weather?

THE WITNESS: No, I am not.

MR. PARHAM: Whose responsibility is it to determine whether to take off or land in developing weather or areas of weather?

THE WITNESS: It would be the pilot in command.

MR. PARHAM: During the evening just prior to the accident, how many LLWAS's do you recall during -- alarms do you recall during the time period just prior to the accident?

THE WITNESS: I recall hearing two.

MR. PARHAM: After the aircraft, do you recall any more?

THE WITNESS: No, I do not. I relieved shortly from the position.

MR. PARHAM: At Charlotte tower, who is responsible for taking the visibility checks to determine the visibility?

THE WITNESS: As? Could you specify?

MR. PARHAM: Well --

THE WITNESS: At what time?

MR. PARHAM: When it goes below four miles.

THE WITNESS: Visibility below four miles will be taken from the tower.

MR. PARHAM: Who would take that in the tower?

THE WITNESS: The person in charge, the CIC or the supervisor.

MR. PARHAM: Can you determine a thunderstorm on the ASR-9?

THE WITNESS: No, I cannot.

MR. PARHAM: What can you determine?

THE WITNESS: Precipitation.

MR. PARHAM: Mr. Chairman, I have no further questions. Thank you.

CHAIRMAN HAMMERSCHMIDT: Thank you, sir. Honeywell.

MR. THOMAS: No questions. Thank you.

CHAIRMAN HAMMERSCHMIDT: Airline Pilots Association.

MR. TULLY: Just a few questions. At your station in the control tower, do you receive a flight

strip with information on it regarding the in-bound aircraft?

THE WITNESS: No, I do not.

MR. TULLY: So you wouldn't know if USAir 1016 had information Yankee or not?

THE WITNESS: No, I would not.

MR. TULLY: Were you aware of any inter-facility communications regarding the weather changes occurring at the airport?

THE WITNESS: No, I was not.

MR. TULLY: Where are you physically located, say, in reference to the supervisory controller in the cab?

THE WITNESS: He would be to the rear left of me.

MR. TULLY: Do you have conversation with him while you're at your post?

THE WITNESS: It is possible to physically turn around from my position and communicate with him.

MR. TULLY: Were you aware that someone in the tower called the weather service to report visibility at one mile?

THE WITNESS: No, I was not.

MR. TULLY: Who would that person have been?

THE WITNESS: I wasn't aware that anyone called. I don't think I follow your question.

MR. TULLY: Were you here for the testimony of Mr. Welch from the National Weather Service?

THE WITNESS: No, I was not.

MR. TULLY: Perhaps we should refer to that Exhibit. Does he have Exhibit 5 or is he responsible for Exhibit 5?

CHAIRMAN HAMMERSCHMIDT: Which one, Captain Tully, which 5?

MR. TULLY: I'll try -- I'll get a reference right here. I just wanted to document once again that Mr. Welch -- maybe we can get it from the stenographer, that Mr. Welch has testified that he received a call from the tower advising him that the visibility had gone to one mile and whom he might have got that communication from.

CHAIRMAN HAMMERSCHMIDT: Mr. Vincent, did you say you did not know?

THE WITNESS: I did not know. I was not aware. From my position, I will not -- can I overhear the phone conversations between other people in the

tower and who is talking or whatever else from my position.

CHAIRMAN HAMMERSCHMIDT: I believe that's all pretty much on the record, isn't it, unless we need to refine it somehow.

MR. TULLY: In the statement of Mr. Welch, I believe he states that between 1836 and 1840, he was notified by the Charlotte tower that the visibility was down to one mile. That's the reference that I'm talking about here.

Were you aware of anybody from the Charlotte tower calling the weather service to advise that visibility was one mile?

THE WITNESS: Sir, I don't have a copy of the tower layout, but the flight data position, the supervisor's position, all of those positions are to the rear, behind -- to the rear left of me.

MR. TULLY: At any time, do you recall your supervisor alerting you to the fact that visibility was one mile?

THE WITNESS: No, I do not.

MR. TULLY: There was no general announcement in the tower to that effect?

THE WITNESS: I don't recall that. I cannot state to you there was not one. I do not recall one.

MR. TULLY: If the supervisor was aware that the visibility had gone to one mile, would you have expected him to turn the RVR equipment on?

THE WITNESS: I would expect to be advised the visibility was at one mile if I didn't know.

MR. TULLY: Would you expect your supervisor to have notified you of that information?

THE WITNESS: Yes.

MR. TULLY: And either you or the supervisor at that point would have turned the RVR equipment on?

THE WITNESS: Yes.

MR. TULLY: And you are completely aware of the requirement when prevailing visibility is one mile to report RVR to in-bound aircraft?

THE WITNESS: Yes.

MR. TULLY: Okay. The final west controller who was testifying just before you indicated that he had received an alert, I believe, from the arrival wall coordinator that indicated the visibility was one mile. Do you recall that testimony?

THE WITNESS: I was not here for that.

MR. TULLY: Let me ask you a more general question about intra-facility communication. If the supervisor observes that visibility is one mile and he alerts the arrival wall supervisor and then the arrival wall supervisor would alert the radar controller; is that the flow of information that you would understand? Is that how it should work?

THE WITNESS: The coordination that would take place in the radar room at the time, I cannot speculate on what would have happened.

MR. TULLY: The point I'm getting to is apparently at 2240 and 01, which was a full two minutes prior to the airplane crashing, there is evidence here which would show that the final west controller knew that the visibility was one mile. I guess my question is how would he know; and why is that you wouldn't have that same information? It apparently generates -- that information starts somewhere and gets to the final west controller. It doesn't get to you obviously, or at least that's your testimony. Is that correct?

THE WITNESS: What I'm stating is, sir, is I don't know what coordination took place between the arrival wall supervisor and the supervisor in the

tower. My position is to the extreme right in the tower cab. I cannot always overhear a conversation between an arrival wall supervisor and a tower supervisor. I for a fact do not know who called and told the arrival wall supervisor or if the arrival wall supervisor told the controller. I don't know that. I cannot state that as a fact.

MR. TULLY: You were talking about the requirements for limiting communications to airplanes that might be in a critical phase of flight. Is that routine information or is that all information? I mean, if you were in possession of information that weather was deteriorating at the airport; I mean, would you still not tell the flight because he was in a critical phase of flight? Or would you consider that more important than, say, the requirement to keep quiet during the critical phase of flight? How would you evaluate that?

THE WITNESS: Let me clarify something for you, sir. As I stated earlier in my statement, I had a conversation with an aircraft that was holding short behind 806. It was a number one aircraft. And I asked him did he want a taxi in front of the aircraft. And

as I was scanning, looking at my BRITE, looking at the wind indicators and doing other things, and I turned as part of my scan and looking out at the runway to look at the final, I noticed that the rain had intensified or that the approach into runway 18 right had become partially obscured.

Within a matter of me -- a matter of seconds later when I noticed that, USAir 806 stated that he was going around.

MR. TULLY: Were you aware that there was a thunderstorm overhead the airport?

THE WITNESS: I was aware that there was rain on the airport.

MR. TULLY: Do you recall any conversation with USAir flight 806?

THE WITNESS: I can refer back to the transcript.

MR. TULLY: How about Exhibit 3-B, page 4?

THE WITNESS: Yes.

MR. TULLY: Time 2239 and 12, see where it says, "USA 806" there?

THE WITNESS: Yes.

MR. TULLY: Eight O six says, "Looks like

we've got a storm right on top of the field here." What's your reply?

THE WITNESS: Affirmative.

MR. TULLY: So you agree with 806 that there's a storm right over the field.

THE WITNESS: A rain storm or whatever, I will categorize it. I am not qualified to categorize it as a thunderstorm. He says, we've got a storm on top of the field. I can see rain. A rain storm. I said affirmative.

MR. TULLY: Okay. Well, I don't know what -- I'm not asking you to characterize the intensity of the storm --

THE WITNESS: No, what I --

MR. TULLY: -- I just want to know if you're in general agreement with 806 that there was a storm on the field.

THE WITNESS: Yes, exactly. I said affirmative. I do generally agree that there is a storm on top of the field. What I want to clarify is I was not saying that it was a thunderstorm. I am not qualified to do that.

MR. TULLY: Okay. Okay. Did you take this

to be interpreted as this was a PIREP, pilot report? Could this be considered a PIREP?

THE WITNESS: It could be. You could interpret it as that, yes.

MR. TULLY: I'll just ask you one last question. Did you at any time relate to USAir flight 1016 that there was a storm overhead the airport?

THE WITNESS: No, I did not.

MR. TULLY: I don't have any other questions. Thank you.

CHAIRMAN HAMMERSCHMIDT: Thank you, Captain Tully. USAir.

MR. SHARP: Yes. We have a question. Do you recall what position the approach lights were in during the time 1016 was approaching the runway?

THE WITNESS: No, I do not.

MR. SHARP: Would you have had control over those lights?

THE WITNESS: The light panel is to the right and behind me.

MR. SHARP: Who would have had control over the approach lighting system; was that you or the supervisor?

THE WITNESS: Normally the supervisor would be in control. If he wanted -- he's on the other side of the tower. If he wanted me to change the lights or something like that, it's possible for him to tell me. I'd be the closest person to the panel.

MR. SHARP: Do you recall if they were on at all?

THE WITNESS: I don't remember looking. I don't recall.

MR. SHARP: That's all we have. Thank you, Mr. Chairman.

CHAIRMAN HAMMERSCHMIDT: Thank you, Mr. Sharp. Douglas Aircraft Company.

MR. LUND: No questions, Mr. Chairman. Thank you.

CHAIRMAN HAMMERSCHMIDT: Thank you. International Association of Machinists.

MR. GOGLIA: No questions.

CHAIRMAN HAMMERSCHMIDT: Thank you, Mr. Goglia. Association of Flight Attendants.

MS. GILMER: Thank you. No questions.

CHAIRMAN HAMMERSCHMIDT: Pratt and Whitney.

MR. YOUNG: No questions. Thank you.

CHAIRMAN HAMMERSCHMIDT: Dispatchers Union.

MR. SCHUETZ: Mr. Chairman, no questions for Mr. Vincent.

CHAIRMAN HAMMERSCHMIDT: National Weather Service.

MR. KUESSNER: No questions.

CHAIRMAN HAMMERSCHMIDT: Federal Aviation Administration.

MR. DONNER: Yes, sir, just a few. Mr. Vincent, I'd like to refer you to Exhibit 3-A, page 4. I'm sorry. It's 3-B. Down toward the end of the page, time 2239 and 47 seconds, could you read the transmission from the aircraft to you?

THE WITNESS: "USAir 1016, I appreciate a PIREP from that guy in front of us."

MR. DONNER: And your response to that, please?

THE WITNESS: "USAir 983, turn left at the next forward high speed and said how the ride was on the final, sir."

MR. DONNER: How was the ride reported on final? It goes on on the next page.

THE WITNESS: At 2240 and 33 seconds, USAir

983 read back, "Smooth. USAir 983."

MR. DONNER: Did you pass that information to the accident aircraft?

THE WITNESS: Yes, I did. Do you want me to read it from the transcript?

MR. DONNER: Yes, sir.

THE WITNESS: At 2240 and 40 second, "USAir 1016, copy FK 100, just exit the runway, sir. He said smooth ride."

MR. DONNER: At 2240 and 56 on the same page, your transmission, would you read it, please?

THE WITNESS: "USAir 1016, wind now 100 at the 200."

MR. DONNER: And the next?

THE WITNESS: "USAir 1016."

MR. DONNER: And one more time, your next transmission at time 2241 and 05?

THE WITNESS: "Wind shear alert, northeast boundary wind, 190 at 13."

MR. DONNER: Mr. Vincent, did you ever recall in your experience air carrier aircraft making a missed approach or a go-around based on your reports of wind or precipitation on final approach?

THE WITNESS: I cannot recall.

MR. DONNER: I have no further questions. Thank you.

CHAIRMAN HAMMERSCHMIDT: Thank you, Mr. Donner. Any more questions from the technical panel, Mr. Feith?

MR. FEITH: Yes, sir. Mr. Vincent, just a couple of questions. Do you recall the time from when you received the wind shear alert or were aware of the wind shear alert up in the tower to the time you issued it to the crew of 1016?

THE WITNESS: I issued it immediately. As soon as I saw it, I issued it.

MR. FEITH: You had stated in a statement right after the accident when the investigators had come to interview you and you had described a down pour. Can you give me some sense of what your description of a down pour is?

THE WITNESS: I don't recall exactly using that word. It's very possible. Obviously I did. It's in the transcript. But I would -- my personal observation of a down pour would be raining extremely hard.

MR. FEITH: And when you were up in the tower and you looked out the window and you saw the rain at the approach end of 18 right, was the rain falling straight down or was it blowing, do you recall?

THE WITNESS: I can't recall.

MR. FEITH: And there was some mention about the critical phase of flight and that your response, as I recall, was that your understanding during the critical phase of flight was that your discussions or transmissions to the aircraft were basically limited?

THE WITNESS: I would keep it -- unless something was absolutely necessary, I wouldn't say anything to them.

MR. FEITH: Would you believe that printed information about developing or intensifying weather would be pertinent enough to issue to a crew?

THE WITNESS: At the time that -- excuse me for cutting you off. Go ahead, sir.

MR. FEITH: No.

THE WITNESS: At the time that I noticed it, sir, I definitely would consider that pertinent information. But I never had time. When I noticed it started to rain intensely, as soon as -- when I noticed

that, the aircraft stated that he was going around. And then I became busy coordinating the go-around procedure.

MR. FEITH: And as I recall, again, during some of your previous testimony, you said that when asked, you felt that -- or you believed that the crew of flight 1016 was aware of the weather on final approach? Did I understand that correctly?

THE WITNESS: I don't -- could you read back? I don't remember what I answered.

MR. FEITH: From what I recall, when someone asked you about if you believed or not that the crew was aware of that weather at the approach end that was obscuring the approach end of the runway, as I recall, there was some testimony about you saying that you felt that they were aware of that weather?

THE WITNESS: Oh, yes.

MR. FEITH: What was that belief based on?

THE WITNESS: Well, he asked for two PIREPS from aircraft that -- well, I gave him one PIREP when he checked in; that the aircraft exiting the runway reported a smooth ride. He asked for another one. So obviously he was aware that something was happening on

the airport.

MR. FEITH: Did that not heighten your awareness to the fact that there might be something?

THE WITNESS: Yes. Yes.

MR. FEITH: Can you just recall for me in your testimony you were talking about the use of the RVR and that you had used -- you had actually activated or turned on the RVR system in the past. Can you just give me a sense again -- because I was taking notes -- what your idea of when that RVR should be reported? What's the visibility requirement?

THE WITNESS: Prevailing visibility is one mile or less.

MR. FEITH: Okay. As I recall from looking back in Exhibit 3-A, which is the Air Traffic Control Group Chairman's report, when they had come to interview you shortly after the accident, there was a discussion about the use and the issuance of RVR, and that you had made a statement that the RVR prevailing visibility -- or RVR would be used when prevailing visibility is less than one mile. And today you've characterized the fact that it's one mile or less.

Is this because you have now understood it,

or did you actually know it at the time of the accident?

THE WITNESS: I actually knew it at the time of the accident. And probably, sir, when I was interviewed, I probably had not slept for probably 48 hours. I misspoke.

MR. FEITH: Okay. In considering the fact that the requirement for RVR is one mile or less and the fact that when you lost contact with 1016, and the fact that the RVR or the visibility had gone to a mile or less, were you ever made aware that the RVR was in existence; and did you ever issue to any other aircraft the RVR?

THE WITNESS: Sir, after 1016 went around, I wanted to confirm his heading, because he was going around in an unusual place going to another controller's air space. When I had gotten a response from 1016, my next immediate thing to do was to find that airplane.

MR. FEITH: Okay. Subsequent to the identification that the aircraft had gone down, because you -- if I recall, you had asked another aircraft if there was smoke?

THE WITNESS: No. I asked the aircraft that was following USAir 1016 did he see anything. I could not get any response. And I asked if could he see anything.

MR. FEITH: How long were you on position after that?

THE WITNESS: I don't exactly recall. Like I say, I was relieved shortly.

MR. FEITH: Okay. But you were never made that RVR was then an issue after the accident? That is, nobody ever reported to you -- a supervisor didn't come up to you and say, you're going to report RVR as such and such, or actually activate the RVR system?

THE WITNESS: At the time -- at that time, sir, we were trying to find out where 1016 was and the status of 1016.

MR. FEITH: One last thing. You said during the course of your interview you had questioned 1016 during the execution of their go-around, because they were altering a course to the right. Why did you question the crew?

THE WITNESS: I wanted to confirm that he was turning right. The normal go-around procedure would be

to give the aircraft runway heading. There would be sterile air space that would -- the aircraft stated he was going around. The runway heading climb to 3,000 would separate him from any known traffic that I had. And the aircraft stated that he was turning right. Now, I have to worry is there anything else there and have to separate him from that traffic. So that's why I wanted to confirm.

That was the basis for the question, understand you're turning right, was to be sure that's where he was going, where I could call the approach control's air space -- the approach controller, whose air space that he would be entering, alert him to the fact that that craft was coming or did he have any traffic that I needed to separate 1016 from.

MR. FEITH: Thank you very much, Mr. Vincent. I have no further questions, Mr. Chairman.

CHAIRMAN HAMMERSCHMIDT: I would like to follow-up on Mr. Feith's question. How many go-arounds do you typically handle on a given day?

THE WITNESS: That would be mere speculation, sir. I couldn't speculate. I don't have any idea.

CHAIRMAN HAMMERSCHMIDT: Okay. Whatever that

number is, how many would be a go-around that would have a deviation, say, away from the runway heading?

THE WITNESS: Very few. Most of the time I would issue missed approach instruction to be issued to the pilot. There were very few. As a matter of fact, I can't recall ever having one.

CHAIRMAN HAMMERSCHMIDT: Let's see. Mr. Laynor.

MR. LAYNOR: Just a couple. Mr. Vincent, have you had any training as a controller on the hazard of wind shear and how it affects aircraft?

THE WITNESS: During the briefing of the bulletin that's used in an Exhibit.

MR. LAYNOR: Is that the extent of your training, the bulletin that's an Exhibit?

THE WITNESS: Yes, that type of training.

MR. LAYNOR: Are you familiar with the terms, "down burst" and "micro burst"?

THE WITNESS: The term, "micro burst," yes. I'm familiar with the term.

MR. LAYNOR: What does your training consisted of with regard to micro burst? What are you told?

THE WITNESS: Reading materials is the extent of my training.

MR. LAYNOR: In answering -- responding to USAir 806, you confirmed that you knew there was a storm on the field. If you had seen lightning, would your response have been any different with regard to passing information on the 1016?

THE WITNESS: I don't know.

MR. LAYNOR: Is there a significant difference in a heavy rain shower with lightning and without lightning in your opinion as far as the hazard to aircraft?

THE WITNESS: Are you asking if I saw lightning, would lightning be more hazardous?

MR. LAYNOR: No. I'm asking you whether you would differentiate between a storm that has lightning in or a storm that obviously has high intensity rainfall as far as the hazard it presents to aircraft.

THE WITNESS: I would say there's a difference, yes.

MR. LAYNOR: Thank you, sir.

CHAIRMAN HAMMERSCHMIDT: Mr. Clark.

MR. CLARK: On 2241:05, you issued the wind

shear alert for the northeast boundary. Do you recall any observations of the weather at that time?

THE WITNESS: No, I do not.

MR. CLARK: You picked up the wind shear alert. You broadcast that. Do you normally look out and see what's going on out on the field?

THE WITNESS: Well, I can tell you what happened at the time.

MR. CLARK: Okay.

THE WITNESS: At the time, I was talking to the aircraft. And when you listen to the whole tape, the wind shear went into alarm on the tape. You can hear the alarm going off in the background. And I turned and I looked at it, and that's what I saw flashing. So that's what I issued.

MR. CLARK: But you have no recollection of looking out and seeing it?

THE WITNESS: I have no recollection of the exact condition at that time that I issued the wind shear, no, I do not, sir.

MR. CLARK: Then a few at 2241:34, USAir 806 indicated that they would like to set tight. Did you look out at the tower at that time and observe any

weather phenomenon at that time? Do you recall doing that?

THE WITNESS: Yes. I do recall that it was still raining and that the rain was moving -- well, I won't say moving, but it had started to rain on the other side of the airport, also.

MR. CLARK: On the other side?

THE WITNESS: As I stated earlier, it started to rain first to the south and to the west and to the east of the airport. I do recall it was now raining also at the approach to runway 18 right -- well, the west side of the airport, also.

MR. CLARK: But you still had visibility of that area?

THE WITNESS: Yes. I still had visibility of the area.

MR. CLARK: Thank you.

CHAIRMAN HAMMERSCHMIDT: Following up on that question, you answered earlier that you do not know, other than looking on a chart, what the distance between the control tower and the threshold of runway 18 right is?

THE WITNESS: That's correct. I don't know

what the distance is.

CHAIRMAN HAMMERSCHMIDT: Don't know what the distance is.

THE WITNESS: No, sir.

CHAIRMAN HAMMERSCHMIDT: Mr. Schleede.

MR. SCHLEEDE: Just one question. To your knowledge, have there been any changes in policies and procedures in the tower since the accident?

THE WITNESS: Not to my knowledge, sir.

MR. SCHLEEDE: Thank you.

CHAIRMAN HAMMERSCHMIDT: I have just one last question, which follows up on Mr. Feith's last questioning. When USAir 1016 announced that it was on the go and you responded, "USAir 1016, understand you are turning right," I want to be sure I understand this.

Your answer was that it was mainly for informational reasons --

THE WITNESS: Yes.

CHAIRMAN HAMMERSCHMIDT: -- that you responded that way.

THE WITNESS: Yes, sir.

CHAIRMAN HAMMERSCHMIDT: For traffic

separation purposes.

THE WITNESS: Yes, sir, that's correct.

CHAIRMAN HAMMERSCHMIDT: Was any part of that response related to the fact that not many -- as you stated before, not many flights would deviate, say, to the right?

THE WITNESS: That's correct. Normally, the first thing after I issue a missed approach instruction, I will call the departure west controller or the controller would alert the departure west controller that we had a go-around and start coordinating, because the aircraft would generally enter his air space.

When the aircraft says he's turning right, stop. Got to call somebody different this time. So it changes things.

CHAIRMAN HAMMERSCHMIDT: Okay. Another question. How many times have you issued weather echo intensity from the BRITE-D to pilots?

THE WITNESS: I can't recall.

CHAIRMAN HAMMERSCHMIDT: Any ballpark figure?

THE WITNESS: I have done it before. How many times, I can't recall.

CHAIRMAN HAMMERSCHMIDT: Any more questions for this witness?

(No response.)

CHAIRMAN HAMMERSCHMIDT: Thank you very much, Mr. Vincent. You may step down.

THE WITNESS: Thank you.

CHAIRMAN HAMMERSCHMIDT: I appreciate your cooperation.

THE WITNESS: Thank you.

(Witness excused.)

CHAIRMAN HAMMERSCHMIDT: We're going to adjourn for the day and our plan is to reconvene the hearing at 8:30 in the morning. So we stand in recess.

(Whereupon, at 4:50 p.m., the hearing was adjourned, to reconvene on Tuesday, September 20, 1994, at 8:30 a.m.)

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