NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Washington, D.C. 20594

April 10, 1997

AIR TRAFFIC CONTROL GROUP CHAIRMAN'S FACTUAL REPORT

A. ACCIDENT

NTSB No:	DCA97MA017
Aircraft:	Comair 3272, Embraer EMB-120RT
Date:	January 9, 1997
Time:	2055 UTC, or 1555 EST
Location:	Monroe, MI

B. AIR TRAFFIC CONTROL GROUP

Chairman:	Allen E. Lebo National Transportation Safety Board
Member:	Ken Durham, FAA
Member:	Capt. Gregory A. Bland, ALPA
Member:	Keith Stamper, Comair
Member:	Darren Gaines, NATCA

C. SUMMARY

Comair 3272 crashed while being vectored by the Detroit Metro TRACON for approach to runway 3R at Detroit Metro Wayne County (DTW) Airport. The Flight was operated under the 14 Code of Federal Regulations (CFR), Part 135 and carried 26 passengers and 3 crew members.

D. DETAILS OF INVESTIGATION

1. Facility Briefing

At the beginning of the investigation the ATC Group requested and was given a briefing by facility personnel. Following is a synopsis of that briefing:

> When the accident occurred, inbounds were arriving over the MIZAR intersection from the south, and southwest. Turbojets were arriving at 12,000 ft, and turboprops were arriving at 11,000 ft. The approach in use was the ILS to 3 right. Information Hotel was current at the time.
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> Shortly after Comair 3272 and Cactus 50 (the aircraft that preceded Comair 3272) came on the frequency, the feeder controller advised all aircraft that ATIS information "Alpha" was current. He then read the new weather, "wind 070 at six, visibility 1 ½, light snow. Six hundred broken, one thousand one hundred broken, two thousand one hundred overcast. Altimeter 29.19. 3R RVR is 6,000, braking action reported poor by a DC9."
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> The ATIS identification procedure at the TRACON is to cycle from Alpha through Hotel, and then back to Alpha, in order to prevent confusion with ATIS reports transmitted by other airports in the area.
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> A normal vector pattern was being used as outlined in the facility SOP. Facility personnel indicated that all Navaids were functioning properly.

2. Detroit TRACON

Detroit Metro TRACON 's total staffing was about 54 controllers, 8 supervisors, 2 area managers, and 4 traffic management coordinators, plus 1 traffic management supervisor.

3. History of Flight

Comair 3272 was cleared for takeoff on runway 27 at the Cincinnati (CVG) Airport at about 2008 UTC. After takeoff the flight had been instructed to fly heading 290. About a minute after takeoff the local controller told Comair 3272 to contact departure control. Departure control instructed the flight to climb and maintain 6,000 feet . At 2011 UTC Comair 3272 was instructed to turn right heading 310, and to climb and maintain 11,000 feet. About a minute later the flight was instructed to turn right heading 340. After another minute the flight was told to turn right heading 040, "on course." Comair

3272 was then told to contact Indianapolis Air Route Traffic Control Center. After establishing contact, Comair 3272 was told to climb and maintain FL190, and to proceed direct Dayton VOR (DQN), then the Mizar2 arrival. At 2019 UTC the controller instructed Comair 3272 to contact the Indianapolis ARTCC on 134.7.

The flight contacted Indianapolis ARTCC leaving 14,300 climbing to FL190. Comair 3272 was advised of light chop around 15,000-16,000, above 16,000 being "pretty smooth." At 2023 UTC Comair 3272 reported that they were in cloud tops at FL190 and requested FL210. They were then assigned FL210. At 2027 UTC the controller asked how the ride was at FL210 and Comair 3272 replied that it was smooth. About 2 minutes later Comair 3272 was instructed to contact Cleveland ARTCC on 123.9.

After contacting the Pandora sector at Cleveland ARTCC, Comair 3272 reported a smooth ride at FL210. After coordinating with the next sector, the controller issued the local altimeter setting, instructed Comair 3272 to descend to 12,000 ft., and to contact another sector of the Cleveland ARTCC.

The new sector, Litchfield, issued a no-delay descent clearance for traffic. Comair 3272 acknowledged. At 2039 UTC the controller issued descent clearance to 11,000 feet, and a heading for arrival. At 2041 UTC a handoff was initiated to the Detroit TRACON. The handoff was accepted, and at 2042 UTC the Litchfield controller instructed Comair 3272 to contact the Detroit TRACON.

At 2043:03 UTC Comair 3272 contacted the Detroit TRACON and reported being at 11,000 ft. The feeder controller instructed the flight to depart the Mizar intersection "...heading 050, vector to ILS runway 3 right final approach course, runway three right braking action reported poor by a DC Niner." About a minute later, the controller told Comair 3272 to maintain 190 knots, and if unable to advise. Comair 3272 acknowledged. At 2045:46 UTC the controller assigned Comair 3272 7,000 ft. After this, Comair 3272 was then issued three headings: At 2046:11 UTC Comair 3272 was assigned a heading of 300 for sequencing; at 2047:18 UTC Comair 3272 was assigned a heading of 055; and at 2048:44 Comair 3272 was assigned a heading of 070. Comair 3272 acknowledged each heading change. At 2049:59 UTC Comair 3272 was issued a heading of 140 degrees and a speed reduction to 170 knots. About 30 seconds later Comair 3272 was told to contact approach control on 125.15 (the final approach controller).

Comair 3272 established contact with the final controller at about 2050:45 UTC. The controller then issued a speed reduction to 170 knots and a descent to maintain 6,000 ft. About ½ minute later the flight was issued a turn to a heading of 140, and a minute later Comair 3272 was issued a descent to 4,000 ft. At 2053:24 UTC Comair 3272 was issued a right turn to heading 180, and was given a speed reduction to 150 knots. A left turn to 090 was then provided with instructions to plan on vectors across the ILS. At 2054:38 UTC Comair 3272 was issued a left turn heading 060 with instructions to join the

localizer. Instructions were also given to maintain 3,000 ft. No response was received. The controller tried repeatedly to re-establish contact with Comair 3272, but there was no response.

4. Airport Terminal Information Service (ATIS)

The ATIS information being broadcast to pilots was as follows:

> Detroit Metropolitan Airport Information Hotel, 2026Z special. Wind 070 at 6, visibility one, light snow. Six hundred scattered, ceiling 1,400 broken, 2100 overcast. Temperature, minus 3. Dew point, minus 4. Altimeter 29.21. Remarks AO2[1]. Tower visibility one and one half. Papa zero zero zero zero.[2] ILS approach in use, runway 3 right. Departing runway 3 center. Notices to airmen: runway 21 right 3 left closed, runway 27 left 9 right closed, runway 27 right 9 left closed, taxiway Y11 closed, braking action advisories in effect, local deice procedure in effect. Gate-hold procedure in effect for Newark, Kennedy, Chicago O'Hare, Philadelphia, Saint Louis, Grand Rapids airport. Advise on initial contact you have information Hotel.

> Detroit Metropolitan airport information Alpha. 2040Z special. Wind 070 at 5, visibility one and one half, light snow, mist. Ceiling 600 broken, 1100 broken, 2100 overcast. Temperature minus 3, Dew point minus 4. Altimeter, 29.19. ILS approach in use, runway 3 right. Departing runway 3 center. Notices to airmen: runway 21 right 3 left closed, runway 27 left 9 right closed, runway 27 right 9 left closed, taxiway Y11 closed, braking action advisories in effect, local deice procedure in effect. Gate-hold procedure in effect for Newark, Kennedy, Chicago O'Hare, Philadelphia, Saint Louis, Grand Rapids airport. Advise on initial contact you have information Alpha.

Note: The ATIS at Detroit Metropolitan is **not** spoken and recorded by a controller. A computer "speaks" and the ATIS is recorded automatically. Please note the footnotes on this page.

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[1] "Remarks AO2" means an automated observation with precipitation discriminator.

[2] "Papa zero zero zero zero" means P0000 which is the amount of precipitation, in hundreths of an inch, since the last observation.

5. Controller Interview Summary

Mr. Gregory V. Martin was working the Feeder Control Position. Facility records indicated an EOD date of 4/23/89. He was assigned to Flint ATCT. He was later assigned to Detroit TRACON on 6/16/91. His last tape talk was 12/6/96. He became an FPL (full performance level controller) on 7/19/92. His physical contained a limitation which stated that he "shall possess correcting lenses for near vision while performing ATCS duties." In response to questions he provided the following information:

- His last physical exam was August, 1996.
- He was wearing his glasses when he worked Comair 3272.
- His initial assignment to the FAA was at Flint, MI, in April, '89. Prior to this he was a military controller from June '68 until retirement in 1988. He then was a contract instructor at Seattle ARTCC until April of '89, when he went to Flint.
- He acknowledged having completed items on the last page of his "training folder." This page was unsigned.
- The day of the accident he was assigned the 1:30 pm to 9:30 pm shift. It was the second day of his work week. He had 2 days off prior to starting work that week.
- He initially worked a departure satellite position for about an hour, took a 15 minute break, and then started to work the feeder position about 40 minutes before the accident. He continued to work until 10 minutes after the accident.
- He received a position relief briefing. It consisted of braking action reports, runway usage, and traffic being worked. Additionally, he stated that the briefing included a statement that there were no reports of turbulence or icing.
- From the time he started to work the feeder position until the time of the accident, he characterized the traffic as light and the complexity as light.
- Comair 3272 appeared on his display prior to Cactus 50. When Cactus 50 appeared on his display he made a decision that Cactus 50 would precede Comair 3272 because Cactus 50 was faster and more direct to the inbound fix. He commented that there was a speed differential of 70 to 90 knots showing on the data block.
- He received an icing report, while working a departure sector, about 1 ½ hours prior to working Comair 3272.

- Initially Comair 3272 was told to depart MIZAR on a 050 heading. About the time they both arrived at MIZAR, Comair 3272 was given a 030 heading for spacing.
- Comair 3272's responses had been immediate and normal.
- He felt that Comair 3272 did not have any problems.
- Other aircraft he was working at the time were a Northwest jet behind Comair 3272 and maybe two Mesaba aircraft in a different corridor.
- To compensate for wind drift he assigned Comair 3272 a heading of 140 to achieve a track of 120 degrees for "base."
- He worked four other aircraft on feeder, over Mizar prior to Cactus 50.
- He considered the traffic flow to be normal.
- He knew about the strong winds at altitude when Comair 3272 initially contacted him.
- He indicated surface winds were 50 to 60 degrees at 8 to10 knots.
- It is common to have southwest winds aloft on a runway 3 configuration.
- He was satisfied with his spacing when he handed Comair 3272 off to the final controller. He continued to monitor Comair 3272's progress after the handoff.
- The last time he saw the data block it was partially over-ridden by another data block. He recalled looking at MIZAR intersection, and when he looked back for Comair 3272, the target was gone.
- He found out there had been an accident from the supervisor.
- He noted no equipment malfunctions or abnormalities.
- He considered the operation (general, overall, all-encompassing) to be normal and routine.

Mr. Steven L. Cochran was working the final control position at the time of the accident. His EOD date with the FAA was 2/26/79. His most recent physical was on 6/14/ 96. He had one limitation on his medical certificate which stated, "Shall wear correcting lenses for distant vision while performing ATCS duties." In response to questions he provided the following information:

- He was wearing his glasses when he worked Comair 3272.

- His initial training was received at Oklahoma City.
- He holds a commercial pilot certificate with instrument and multi-engine ratings.
- He holds a Basic Ground Instructors Rating, and a Control Tower Operating Certificate.
- His first assignment was at Fort Wayne, Indiana in July '79. He remained there until November '83, when he came to Detroit Metro, where he has remained to date.
- He achieved FPL status December '84.
- His assigned shift the day of the accident was 1330-2130 local time. He arrived at the facility at 1300-1310 EST to begin his assigned shift. The accident occurred on the second day of his work week.
- Prior to his work week beginning, he had two days off.
- On the day of the accident the first position that he worked was "east satellite departure." He worked that position for 50 - 60 minutes. He then took a 15 minute break. When he returned he began working the east arrival (final) position.
- He said that he had a normal position relief briefing which consisted of weather, including low visibility, tailwind conditions, traffic presently being worked, and inactive traffic. He was also briefed on a lot of compression from the marker inbound. (Air Traffic Control Group Note: Compression, or a tendency toward a decrease in longitudinal separation, occurs on all landings. As an aircraft slows to cross the landing threshold, spacing with the trailing aircraft becomes less. Greater initial spacing is required to offset this effect. On the day of the accident, the effect of compression was exaggerated because a tailwind existed at higher altitudes, and as the aircraft descended into a different parcel of air, the tailwind became a headwind. This created an additional slowing or tendency towards decreased separation in addition to that normally encountered.)
- A tailwind on final and a headwind inside the marker is routine when using runway 3.
- Comair 3272 was southeast bound on a 120 to 140 heading when he took the handoff.
- He provided vectors to Comair 3272 to maintain separation.

- The pilot appeared to react normally when various control instructions were issued.
- After giving a descent clearance to 3,000 ft, the controller noticed that the aircraft was descending out of 4,000 ft even though no acknowledgment for the altitude change had been given.
- Comair 3272 was in the coast track mode at 55:03 UTC.
- He advised the supervisor that he had lost an aircraft.
- 5 to 10 minutes after the accident he was relieved from his position, and learned of the accident.
- The only report of icing that he knew about for that workday came to his attention when he received a relief briefing for the sector, east satellite, identifying icing to the northeast of the airport. This occurred about 2 1/2 hours before the accident. (ATC Group Note: Northwest 243 reported moderate rime ice at 20:31:10 UTC while he [Steven Cochran] was working the final control position. This report was made prior to Comair 3272 coming on his frequency.)
- While working the east satellite position he received a PIREP of light, mixed icing northeast of the airport. (This occurred earlier in his workday.)
- When asked by Cactus 50 about windshear reports, he said there were no reports of any windshear on final. The only information that he had was low visibility, and slick runways. (ATC Group note: Cactus 50 issued a report of winds at 2053:14 UTC reporting the winds were 237 degrees at 32 knots. The controller responded, "you'll pick up a headwind once you get down to probably two thousand feet or so". Radar data shows that at the time of the report, Cactus 50 was at 4,600 feet turning onto the localizer, about 17 miles from the airport.)
- Cactus 50 picked up speed on final.
- The reason he eventually did not need to take Comair 3272 through the localizer was because Cactus 50, once established on the localizer was being pushed by a tailwind, increasing the ground speed. When this happened, the desired separation was attained.
- The controller did not specifically issue the wind information given by Cactus 50 to Comair 3272. (ATC Group Note: Comair 3272 was on the same frequency at the time this was made. There is no requirement for ATC to pass along this type of information.)

- His personal assessment of the winds aloft was that they were "horrendous, blowing pretty good."
- In response to another question, he said the word "horrendous" was a poor choice of words. He said that he associated the expression with winds that are 25 knots or greater.
- He was vectoring to achieve 6-7 miles of separation (longitudinal) between Comair 3272 and Cactus 50.
- He had greater than 3 miles separation. He saw no primary targets in the area. There were no equipment abnormalities or distractions. Traffic was relatively light. There was no traffic close to Comair 3272 from behind, in-trail.
- "Wake turbulence wasn't an issue in my mind." He felt that he had both aircraft positioned in such a way that wake turbulence would not be a concern.
- If there were a pirep received in the tower it would normally take 10 to 20 seconds to receive it in the TRACON.

ATC Group Note: At a later date, after the field phase of the investigation was completed, facility personnel reported that Mr Cochran had listened to a greater portion of the tape than he had listened to prior to his interview. He expressed surprise when he heard the NW243 icing report issued while he was working the position. He reported that the information from NW243 was not mentioned to any of the other controllers. He didn't recall receiving the report.

Mr. Kevin Barttelt was the supervisor on duty in the TRACON when the accident occurred. In response to questions he provided the following information:

- His EOD date with the FAA was 2/10/83.
- His entire career has been at Detroit Metro.
- The day of the accident was the third day of his work week.
- He reported for duty at 11:30 EST.
- Prior to the accident he had been working the supervisor position for approximately 4.5 hours.

- When the accident occurred he was watching traffic in the satellite area, and at 20:55 UTC he was called by the final controller, who thought he may have lost an aircraft.
- He went to the final controller position, and asked what happened. He told the final controller to make a broadcast to Comair 3272. Comair did not respond. He then called the Local Controller and asked him to broadcast to Comair 3272. Again, there was no response from Comair. Afterward, he marked the last known position of Comair 3272 with an "X". He then suspended all inbound traffic, and started holding at all fixes. He relieved the Final Controller, and called the State Police at Monroe MI. With that phone call he received information that they were already responding to an airplane crash. He called a Comair representative, Rob, who supplied him with the "N" number of 265CA and the souls on board.
- He called the State Police who confirmed two of the numbers of the "N" number, and gave a description of the paint scheme which is consistent with that of a Comair aircraft. He also gave the State Police the number of souls on board.
- He then went through his accident checklist, and began to call the appropriate parties.
- He had no problem with control technique utilized by the feeder and final controllers.
- The sequencing of the aircraft was a judgment call. The vectoring was standard, and followed the "SOP" for the facility.
- By 16:10 EST they were "running" approaches again.
- They normally use 2 supervisors per shift.
- He was the only supervisor on duty the night of the accident.
- The night of the accident he arrived home at 21:30 EST.

6. Radar Site Coordinates

Facility Personnel reported that the Detroit ASR9 antenna is located at 42 12 47.14N & 83 22 44.756W. The magnetic variation is 6 degrees west.

7. Ground Track

Cactus 50 issued a report of winds at 2053:14 UTC reporting the winds were 237 degrees at 32 knots. The controller responded, "you'll pick up a headwind once you get down to probably two thousand feet or so". **Radar data shows that at the time of the report, the aircraft was at 4,600 feet turning onto the localizer, about 17 miles from the airport.**

8. Separation Standards between Comair 3272 & Cactus 50

For purposes of wake turbulence separation minima, aircraft are classified according to takeoff weights. The Embraer EMB-120 is classified in the "small" category, having less than a maximum certificated takeoff weight of 41,000 pounds. Cactus 50 was an Airbus 320 which is classified in the "large" category, having a gross takeoff weight less than 255,000 pounds.

The Airbus 320 is not in the "heavy" category, and obviously it is not a Boeing 757. Therefore, the standard radar separation (less than 40 miles from the radar antenna) of 3 miles applies, when altitudes between aircraft are less than 1,000 feet apart. For details, see Pertinent Document L-1 through L-7.

In the "small" behind "large" category, separation is increased to 4 miles over the runway threshold for landing aircraft.

9. Icing Report

At 20:31:10 UTC, as NW 243 was beginning a right turn from the east to intercept the final approach course, descending through 4,800 ft., NW243 reported Moderate Rime Ice to the controller on the final control position.

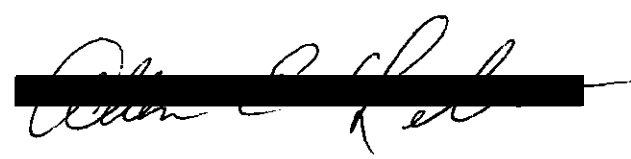
10. Standard Operating Procedures

The feeder-final four post concept is employed for arrival traffic. This concept utilizes two feeder controllers and two final controllers. The four primary fixes are MIZAR (SW), POLAR (NW), SPICA (NE), and CETUS (SE). All are located 40 DME from Metro Airport except MIZAR which is 36 DME. When the ILS to Runway 3 is being utilized, the handoffs are being accepted at MIZAR at 11,000 & 12,000 ft. Turbojets are generally at 12,000 ft. and turboprops are generally at 11,000 ft.

11. Pertinent Documents

The following documents are considered to be pertinent to this investigation:

A. Preliminary Notice/Notification Record (3 pages)
B. FAA Report of Aircraft Accident (5 pages)
C. Transcripts (31 pages)
D. ATIS (4 pages)
E. Flight Tracks (NTSB + FAA Separation log, 11 pages)
F. Facility Records (9 pages)
G. Personnel Statements (3 pages)
H. Flight Strip (2 pages)
I. SOP Excerpts (15 pages)
J. NOS Charts (2 pages)
K. Facility Layout Diagram (1 page)
L. Wake Turbulence Procedures, 7110.65 (7 Pages, current at time of accident)
M. Pirep Procedures, 7110.65
N. Facility Manager's Letter (1 page)



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