NATIONAL TRANSPORTATION SAFETY BOARD
Office of Aviation Safety
Washington, DC 20594

SURVIVAL FACTORS GROUP CHAIRMAN'S FACTUAL REPORT

December 21, 2006

I. ACCIDENT

Operator	:	Comair, Inc.
Aircraft	:	Bombardier CL-600-2B19 [N431CA]
Location	:	Lexington, KY
Date	:	August 27, 2006
Time	:	0609 Eastern Daylight Time[1]
NTSB #	:	DCA06MA064

II. SURVIVAL FACTORS GROUP[2]

Group Chairman	:	Jason T. Fedok National Transportation Safety Board Washington, DC
Member	:	Mark H. George National Transportation Safety Board Washington, DC
Member	:	Paul S. Nelson Air Line Pilots Association Hebron, KY
Member	:	D. Scott Lanter Blue Grass Airport Lexington, KY
Member	:	Jennifer Reed Comair Inc. Orlando, FL
Member	:	Linda Berkowitz Federal Aviation Administration Atlanta, GA

[1] All times are reported in Eastern Daylight Time unless otherwise noted.

[2] Not all group members were present for all activities.

Member	:	Lynn Dziad Teamsters Local 513 Florence, KY
Member	:	Nancy Wright Teamsters Local 513 Florence, KY
Observer	:	Ed Malinowski National Transportation Safety Board Chicago, IL

III. SUMMARY

On August 27, 2006, at 0609 EDT, Comair, Inc, flight 5191, a Bombardier CL-600-2B19 crashed during an attempted takeoff at Blue Grass Airport, Lexington, Kentucky. The airplane departed the runway, struck a perimeter fence, and several trees before coming to rest in a field near the airport. The airplane was destroyed by impact and fire and forty-seven passengers and two crewmembers sustained fatal injuries. One crewmember was seriously injured. The flight was conducted under 14 CFR Part 121.

IV. DETAILS OF THE INVESTIGATION

1.0 Airplane Configuration

The airplane was configured with 50 coach-class passenger seats, two cockpit flight crew seats, one cockpit observer's seat, and a retractable, aft-facing, single flight attendant jumpseat mounted on the forward bulkhead. (See Figure 1)

2.0 Crew Information

2.1 Cockpit Crew

Refer to Operations Group Factual Report.

2.2 Cabin Crew

NAME	POSITION	INITIAL TRAINING	LAST RECURRENT TRAINING	FAA CERTIFICATE NUMBER
Mr. Kelly Heyer	Fwd, aft-facing jumpseat	7/16/04	7/6/06	[redacted]

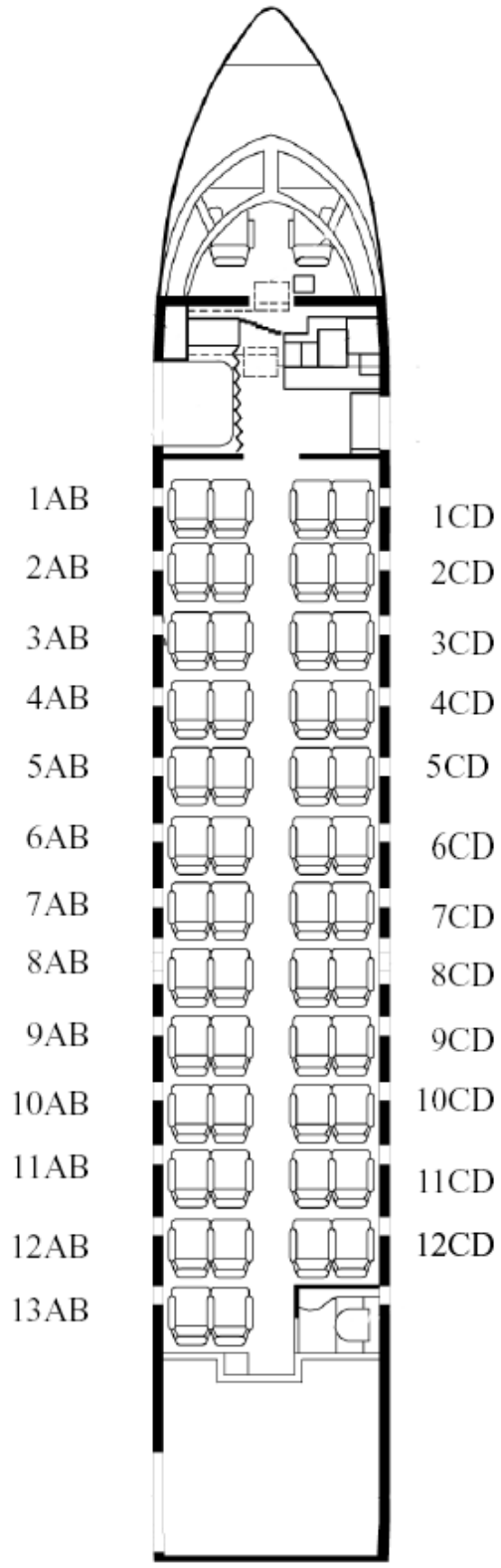

Figure 1. Cabin Configuration

3.0 Passengers

There were 47 passengers on flight 5191. One of the passengers was a non-revenue employee of a different airline who was seated in the passenger cabin but not assigned a seat. The unassigned seats on the flight were 7B, 9D, 12B, and 12D.

4.0 On-Scene Documentation

4.1 Cockpit Area

A fragmented pilot seat frame was found approximately 15 feet to the left[3] of the cockpit area. The seat frame was burned and bent. The headrest was partially attached and mostly unburned. An AmSafe five-point pilot seat belt buckle was found near the seat frame. All five of the belt fittings were inserted into the buckle and all had 4 to 5 inches of webbed belt material extending from the fittings. The ends of all of the webbed belts extending from the buckle were melted. The buckle unlatched normally, and the fittings showed no evidence of deformation.

The first officer's seat was identified in its standard position in the cockpit wreckage. It was examined in detail on November 20, 2006 in a hangar in Griffin, GA. The seat's data plate contained the following information[4]:

Goodrich
1405045511AA
Manufacture date: 04-09-03
TSO C-127A

Figure 2. Aircraft Interior Products model 145 flight crew seat

[3] All directions provided in this document reference the diagram in Figure 1.

[4] According to Comair both of the flight crew seats were "Aircraft Interior Products, Goodrich Corp. Model 145" seats. They were manufactured to TSO-C127.

The first officer's seat was separated in two, with one piece consisting of the main seat structure (including the seat back and the left-side portion of the seat base) and a second piece consisting of the remaining portion of the right side of the seat base. The left forward and aft seat legs were attached to the left floor rail and a fractured section of floor structure (in addition to the seat back). The right forward and aft seat legs were also attached to a floor rail, which was attached to fractured floor structure. The left and right lap belts were attached to each side of the main seat structure, and the rotary buckle (attached to the right lap belt) was operable. The belt was marked "AmSafe, conforms to FAA TSO C-114." The shoulder restraints were not observed while on-scene and were not present during the November 20, 2006 examination. The seat pan and crotch strap were also not observed during the November 20, 2006 examination; however, while on-scene, a seat pan from a pilot seat (with attached cushion) was documented on the ground three feet forward of the cockpit. The crotch strap was attached to the seat pan. The seatbelt buckle insert fitting on the crotch strap was not damaged.

The charred remains of a flight attendant jumpseat were identified just aft of the cockpit area near its normal location in the cabin. No data tag was observed.[5] All of the upholstery and foam from the seat back were missing. The cover for the seat pan was partially attached and was fire damaged. The seat's headrest was not identified. The top telescoping slide mechanism was not attached to the seat. The bottom telescoping slide mechanism was attached to the seat and was functional. The remaining seat frame and seat pan was not bent or fractured.

A cockpit crew life vest container was found approximately six feet forward of the cockpit area. An orange crew life vest was found partially unrolled under the first officer's control column, which was lying flat on the ground under the right-side cockpit area.

The cockpit escape hatch was located approximately 50-60 feet from the right side of the cockpit, perpendicular to airplane fuselage. The operation handle was in the "closed" and stowed position.

4.1 Main Cabin Door

Upon arrival on-scene on August 27, 2006 the main cabin door was noted to be closed and intact in the door frame.[6] It was blackened by heat and a majority of the paint had blistered and peeled from the door's exterior. There was an approximately 1'x 1' hole in the lower center portion of the door in the area of the exterior door handle. The interior portion of the door had been consumed by fire; however, it was observed that four of the lock pins were engaged in the door frame in the closed position. The interior door handle had been consumed by the fire.

[5] According to Comair, the flight attendant jumpseat was a "4 Flight Industries 15680 Series" seat. It was manufactured to TSO-C127.

[6] The main cabin door was later forced open with a hydraulic spreader during the victim recovery process.

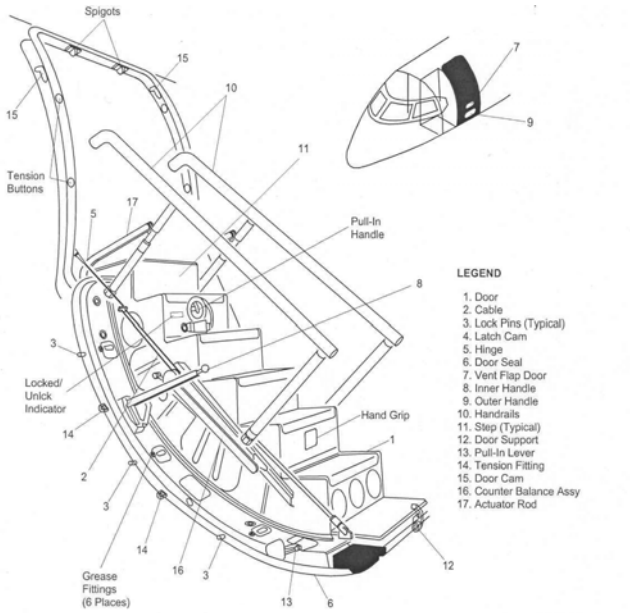

Figure 3. Diagram of the main cabin door (from Bombardier maintenance training manual)

4.2 Forward Service Door

The 1R service door was observed to be fully closed and the unburned portion was intact in the door frame. The outside handle was in the closed and stowed position. The upper one-quarter of the door was missing and had burn damage along the upper edge.

4.3 Passenger Seats And Restraints

The seats and restraint systems throughout the cabin were severely damaged or destroyed by impact and fire. All of the identifiable seats were fragmented and the pieces were documented lying on the cabin floor, or on the ground outside the cabin area, except where noted below. No data tag information was identified on any of the fragments[7]. Fracture surfaces on the seat fragments were covered by soot and/or were melted. The webbed belts on the restraints were almost entirely consumed by fire. Some short sections of unburned belt material were found throughout the cabin; however, all of these sections exhibited some fire damage and/or melting. Longitudinally fractured sections of floor track of varying lengths were found throughout the cabin. None of the seat track sections showed evidence of lip damage from seat attachment fittings. Some of the seat legs remained attached to sections of floor track while other were found lying loose in the cabin area.

[7] According to Comair, all of the passenger seats were manufactured by B/E Aerospace (926 series tourist seats). They were manufactured to TSO-C127.

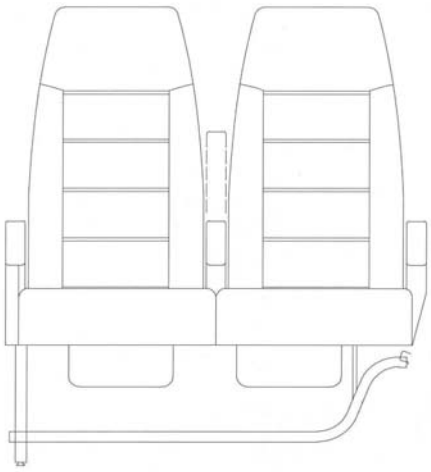

Figure 4. B/E Aerospace 926 series tourist seats (front view)

Figure 5. B/E Aerospace 926 series tourist seats (side view)

Eight AmSafe (patent #5088160) passenger or flight attendant seat belt buckles were found in the debris, and all but one were found with the insert fitting buckled in place. All of these AmSafe buckles operated normally except one, and none showed evidence of deformation. The one buckle that did not operate normally had melted plastic inside the mechanism, which prevented release of the insert fitting.

Only seats 1AB and 1CD could be positively identified by their position within the cabin and the damage to the seats is described in detail below:

Seat 1AB: the forward and aft inboard legs were secured in a section of seat track. The inboard portion of the forward seat tube was partially intact. The remaining seat was loose. The inboard arm rest (tray table storage) was attached. The inboard seat spreader was attached at the forward seat tube and was bent down at a 45-degree angle in the rear.

Seat 1CD: the forward inboard seat leg was secured in the seat track and was twisted clockwise. The remaining seat legs were not secured in seat track. The inboard arm rest (tray table storage) was attached. The seat stretcher was attached at the forward edge and was bent down at the rear at a 45-degree angle.

The most complete seat was found forward of the aft bulkhead, on the ground between the cargo area and the wing box. It was an "A" seat and was separated from the floor and sidewall,. The seat back structure, seat back cushion, seat pan cushion, aft seat tube, arm rests, stretchers, and seat back cushion were all present and there were numerous structural fractures.

4.4 Overwing Exits

A portion of the exterior right side fuselage, containing portions of the overwing exit frame and the window exit, were found lying atop a pile of wreckage in its normal approximate position in the fuselage. The window exit was contained within the frame; however it was no longer secured to the exit frame. The spring-loaded securing pins were extended. A section of wall track was attached to the exit frame. A portion of a seat-mounting bracket, including a one-foot fragment of a seat spreader, was attached to the bracket.

An overwing exit was found on the ground at the back of the main cabin debris area on the right side. The exit release handle was in its normal, closed position. The spring-loaded securing pins were extended. The release handle was in its stowed position and could not be moved. A lamination trim piece for an overwing exit was found two feet from the door. The orientation of the placards on the trim piece indicated it was from the left overwing exit.

4.5 Floor Structure

An eight-foot by four-foot section of floor structure was found in the overwing area and contained several contiguous pieces of floor track. Two one-foot portions of seat leg pieces were attached to the floor track, and were deformed to the left. Four front seat legs (2 inboard AB and 2 inboard CD) were also found attached to the floor track. For more information, refer to the Structures Group Chairman's Factual Report.

4.6 Emergency Equipment

A water fire extinguisher, a Halon fire extinguisher, and two portable oxygen bottles were found lying piled together outside of the cabin wreckage. The water fire extinguisher contained liquid while the oxygen and Halon bottles were empty. None of the bottles had readable gauges.

5.0 Medical and Pathological

The 49 deceased passengers and crew were autopsied by the Fayette County Coroner's Office. Copies of the reports were obtained and the pathologic findings were summarized in an injury chart. See Attachment 2.

The first officer was the sole survivor of the accident and sustained serious, life-threatening injuries. He was rescued from the cockpit wreckage and transported to the University of Kentucky Hospital immediately following the accident. He was discharged to a rehabilitation facility on October 13, 2006. His injuries are summarized in Attachment 2.

5.1 Injury Table

Injuries	Flight Crew	Flight Attendant	Passengers	Other	Total
Fatal	1	1	47	0	49
Serious[8]	1	0	0	0	1
Minor	0	0	0	0	0
None	0	0	0	0	0
Total	2	1	47	0	50

[8] 49 *CFR* § 830.2 defines serious injury as "any injury which: (1) requires hospitalization for more than 48 hours, commencing within 7 days from the date of the injury was received; (2) results in a fracture of any bone (except simple fractures of the fingers, toes, or nose); (3) severe hemorrhages, nerve, muscle, or tendon damage; (4) involves any internal organ; (5) involves second- or third-degree burns, or any burns affecting more than 5 percent of the body surface."

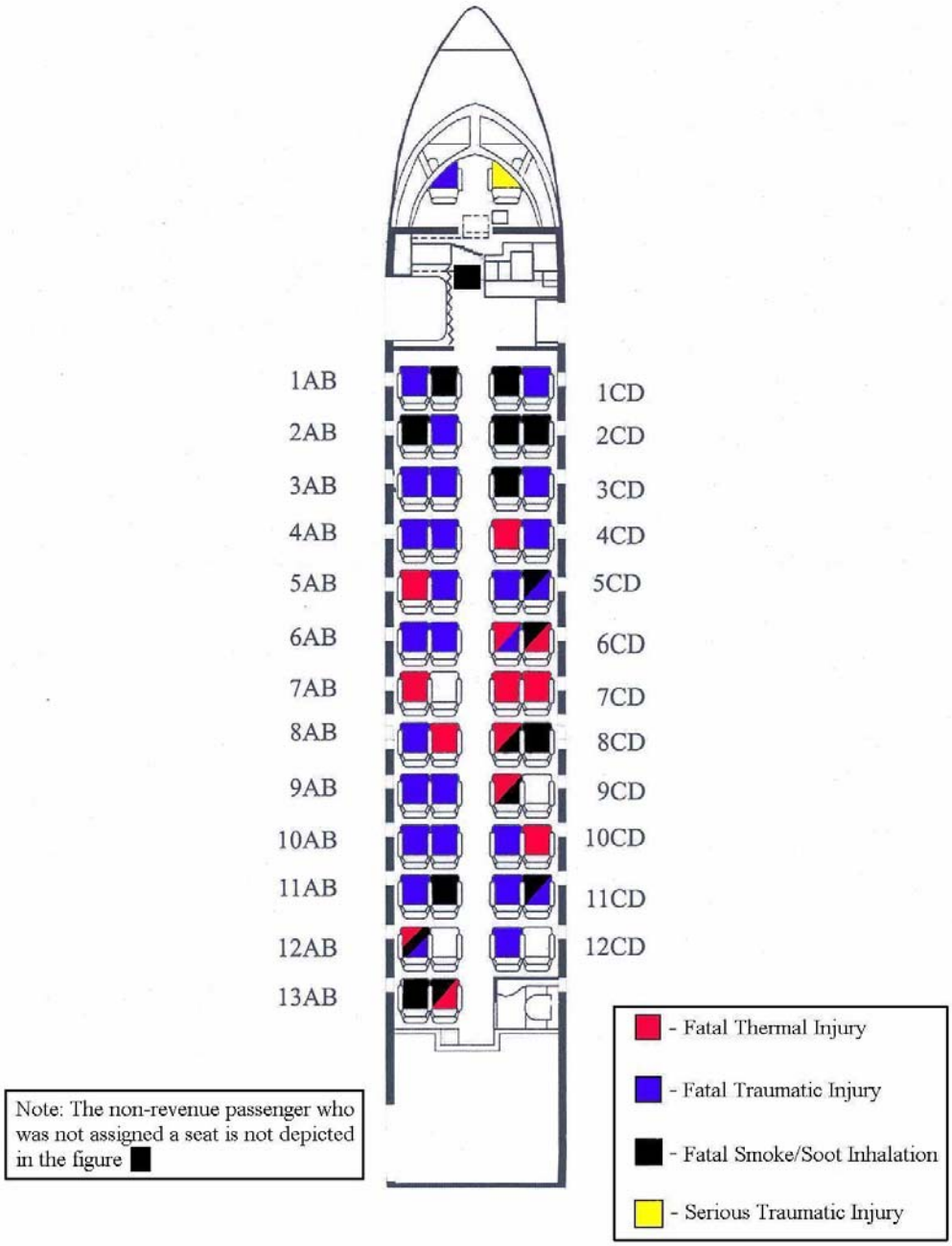

Figure 6.[9] Summary of victims' injury information

[9] The information depicted in this figure was obtained from the official autopsy reports provided by the Fayette County Coroner's Office, hospital medical records, and the passenger manifest of assigned seat locations provided by Comair. Seats with one than one color indicate more than one reported major pathologic finding in the autopsy report. In each case, the seat colors (from top to bottom) reflect the order the findings were presented in the autopsy report. The colors do not reflect any contributing factors listed in the reports, but that information in contained in Attachment 2.

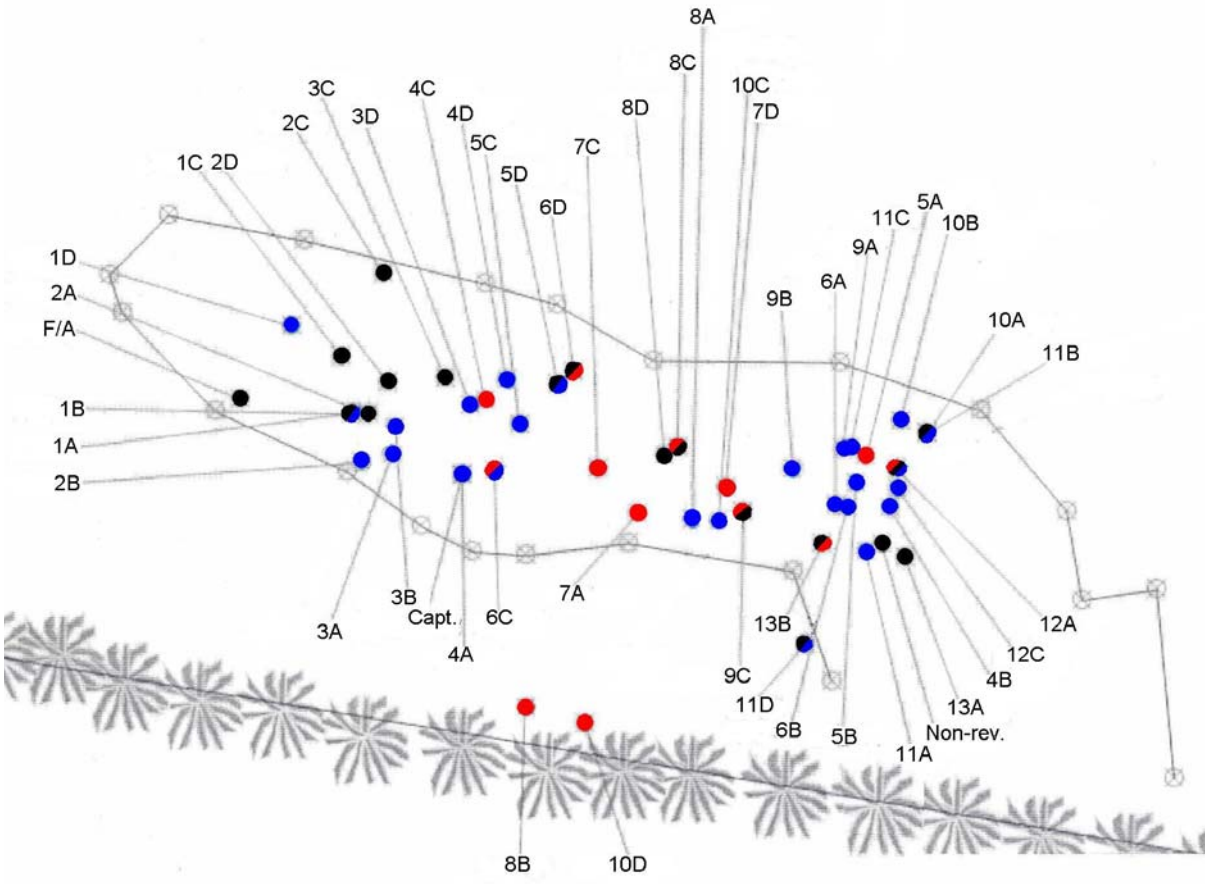

Figure 7.[10] Victim location plot (cockpit to left)

6.0 Airport Information

Blue Grass Airport (LEX) was located approximately four miles west of Lexington, KY. The airport was owned by Lexington-Fayette County Airport Corporation and was governed by a ten member Board of Directors. The Executive Director was Mr. Michael Gobb and the Director of Operations was Mr. John Coon. The airport was located in the County of Fayette and the address was 4000 Terminal Drive, Suite 206, Lexington, KY. Airport latitude was 38 02 11.4999N and airport longitude was 084 36 21.2000W. LEX was an air carrier airport holding an Airport Operating Certificate under 14 CFR part 139, Index B[11]. It had a total of 87,107 aircraft operations (both scheduled and unscheduled) for a period of 12 months ending 10/31/05. LEX had a total of 117 based aircraft and 1 based helicopter.

[10] This plot was obtained from the Total Station survey data provided by the Jessamine County Sheriff's Department and modified using information from the official autopsy reports..

[11] 14 *CFR* §139.315 defined Index B as an airport with five or more average daily departures of air carrier aircraft that are at least 90 feet in length but less than 126 feet in length.

Blue Grass Airport utilized runway 4/22 as the air carrier runway. It was 7,003 feet in length and 150 feet in width. It was served by parallel taxiway (T/W) A and T/W C. Runway 4/22 had a grooved asphalt surface noted in good condition on the airport master plan dated 10/05.[12] Critical aircraft data for this runway were approach category C and design group III.[13] It was a precision approach runway with an ILS for both runways 04 and 22 and, based on the 2005 airport master record, serviced by Simplified Short Approach Lighting System with Runway Alignment Indicator Lights (SSALR) approach lighting.[14] Runway lighting was high intensity with 5 steps. There were edge lights, in-pavement runway centerline and touchdown zone lighting.[15] The 4-box Visual Approach Slope Indicator (VASI) for R/W 04 and R/W 22 were both deactivated as a part of the RSA construction project during the weekend of August 18-20, 2006. The airport did not issue a Notice to Airmen (NOTAM) that the R/W 04 VASI was out of service as it was replaced with a Precision Approach Path Indicator (PAPI), which was installed and flight checked by the FAA on or about June 7-9, 2006. After the flight check the PAPI was deactivated. The PAPI was activated for R/W 04 when the airport reopened on August 20, 2006. The airport did not NOTAM the VASI's for R/W 22 out of service as the equipment was owned and maintained by the FAA. Prior to August 20, 2006, declared distances were published as Takeoff Distance Available (TODA) 7003, Landing Distance Available (LDA) 6603, Takeoff Runway Available (TORA) 7003, Accelerate-stop Distance Available (ASDA) 7003 on August 20, 2006.

Runway 8/26 was a general aviation, daytime-use only[16] runway that was 3,501 feet in length and 150 feet wide (marked to 75 feet[17]). It was used approximately 2% of the time and was served by taxiways A, C and F. Runway 8/26 intersected runway 4/22 just prior to the 2000' distance remaining marker. There was a 1000' distance remaining marker after the runway 26 intersection with T/W C. The pavement was concrete with patches of asphalt for repair. It was noted to be in poor condition on Airport Master Records from both November 2001 and October 2005. There were basic markings for a visual non-precision runway. The runway was equipped with runway edge lights but, according to Mr. John Coon, they had been turned off at the electrical "vault" since the runway was designated as daytime-use only in 2001. Mr. Coon stated that the lights could only be activated at the electrical vault and that only limited airport personnel (i.e. the airfield electricians) had the ability to turn on the lights. According to Mr. Scott

[12] Runway 4/22 was repaved on August 19-20, 2006, and had not been re-grooved at the time of the accident.

[13] For further information, refer to FAA Advisory Circular 150/5300-13, "Airport Design.".

[14] The SSALR approach lighting was replaced by MALSR approach lighting in June 2006 for runway 04. The FAA will place the MALSR for runway 22 in service at a date yet to be determined.

[15] Due to the recent paving, the runway centerline lights and the touchdown zone lighting had not been re-installed as of August 27, 2006. See Attachment 3 for NOTAMs.

[16] This designation was initially made on August 31, 2001 via NOTAM # A-1021 until incorporation of the change in the Airport Master Record in 2001. See Attachment 4.

[17] According to LEX Director of Operations Mr. John Coon, the runway was originally 150 feet wide and was narrowed to 75' with white edge lines and yellow shoulder markings in 2001 because of pavement deterioration on the edges. This occurred in conjunction with the airport's designation of runway 8/26 as daytime-use only.

Lanter, Chief of LEX Department of Public Safety, LEX's eventual plan was to "rehabilitate the 8/26 pavement to 75' width and remove and reinstall the runway lights to current design standards."

On the morning after the accident, Runway 8/26 was closed via NOTAM at 0913 and remained closed until November 1, 2006, coinciding with the opening of new T/W A7. Lighted 'X's were placed on each end of runway 8/26 on Tuesday, August 29, 2006. On Wednesday, August 30, 2006, the 'X' on the '26' end was relocated from the grass area beyond the numbers '26' to the runway surface just south of new T/W A.

Blue Grass Airport was categorized as a firefighting Index B[18] airport serving air carrier aircraft at least 90 feet but less than 126 feet in length. Index B vehicle requirements for LEX were one vehicle carrying at least 500 pounds of sodium-based dry chemical, Halon 1211, or clean agent and 1,500 gallons of water and the commensurate quantity of AFFF for foam production, or two vehicles carrying the same extinguishing agents as noted above.

The airport was equipped with two Oshkosh 3000 gallon ARFF vehicles[19], one Oshkosh 1500 gallon vehicle (E57) and one rescue/command vehicle (R51). E59 and E60 responded to the accident at the time of dispatch and were involved in fire suppression activities. According to Mr. Scott Lanter, E60, the first ARFF vehicle to arrive, began suppression using its high-flow roof turret to knock down the fire followed by the bumper turret and handline suppression. It discharged approximately 3000 gallons of water and 165 gallons of foam. E59 was the second ARFF vehicle on-scene (remaining there for 28 hours) and discharged a total of approximately 5000 gallons of water and 55 gallons of foam. Handlines were also pulled from E59 but were only used to extinguish a flare-up that occurred at approximately 0930. E57 and R51 were utilized to transport additional personnel to the scene but were not active in the fire suppression activities.

LEX had a Public Safety Department (PSD) staffed by Public Safety Officers (PSOs) who worked on a rotational basis as airport police officers and firefighters/EMTs. All officers are cross-trained as police/firefighters/EMTs. According to Mr. Coon, the

[18] 14 *CFR* §139.317 required an Index B airport to have one ARFF vehicle carrying at least 500 pounds of sodium-based dry chemical, Halon 1211, or clean agent and 1,500 gallons of water and the commensurate quantity of Aqueous Film Forming Foam (AFFF); OR one vehicles carrying at least- (1) 500 pounds of sodium-based dry chemical, Halon 1211, or clean agent; or (2) 450 pounds of potassium-based dry chemical and water with a commensurate quantity of AFFF to total 100 gallons for simultaneous dry chemical and AFFF application and a second vehicle carrying an amount of water and the commensurate quantity of AFFF so the total quantity of water for foam production carried by both vehicles is at least 1500 gallons.

[19] Engine 60 (E60) was equipped with 3000 gallons of water/420 gallons of 3% AFFF and 450 lbs. of dry chemical agent. Engine 59 (E59) was equipped with 3000 gallons of water/420 gallons of AFFF and 500 lbs. of dry chemical agent. Additionally, E59 was equipped with a high-reach extendable turret with a Snozzle® device. The Snozzle® contained a nozzle, color camera, Forward Looking Infrared (FLIR) ball camera, and a piercing tip applicator. The piercing tip was not used during suppression. The operator of the vehicle failed to activate the digital hard drive recording device for the cameras.

Public Safety Office was typically staffed on weekends with one Assistant Chief, 5 PSOs, and 1 dispatcher. At the time of the accident there was one dispatcher, two patrolling PSOs, and two PSOs at the ARFF station. He stated that the office never operated with less than 4 PSOs on duty.

Prior to the accident, the airport's last FAA annual inspection was on December 5 and 6, 2005. FAA-issued letters of correction for LEX's last three inspections are included as Attachment 5.

6.1 Airport Observations

Members of the Survival Factors Group made both daytime and nighttime surface observations of the airport on Monday, August 28, 2006 in a 15-passenger van. The van followed the route that the accident airplane traveled beginning at the terminal area, onto T/W A, turned left onto runway 26 and traveled the complete length of the runway. Photographs were taken of the signage near the intersection of T/W A and runways 8/26 and 4/22. (See Attachment 6 for LEX signage and marking diagram) Due to inclement weather conditions (heavy rain) additional daytime photographs were taken on August 31, 2006. (See Attachment 1) The Survival Factors Group members present agreed to the following observations:

- There were two taxiway lead-in lines and one taxiway lead-off line that diverged from the T/W A, runway 8/26 hold short position.[20] From the left to the right, the lead-off line led to runway 26, and the two lead-in lines led to T/W A and the closed portion of old T/W A.[21]
- The lead-in lines and lead-off line were yellow in color and the pavement appeared lightly colored.
- The hold short position sign for runway 4/22 on T/W A was visible from the runway 26 hold short position.
- The blue taxiway lights on the newly designated T/W A between runway 26 and runway 22 were illuminated and visible from the hold short position of runway 26.
- When taxiing onto runway 26 from T/W A the painted number '26' was to the right of the airplane and not rolled over.
- Runway 8/26 was marked as a VFR runway. It was 150' wide but was marked to 75' in width with edge stripes and shoulder markings.
- There was a lighted red and white runway/runway intersection sign westbound on runway 26 prior to the intersection of runway 26 with 4/22. The lighted sign was visible from the runway 26 taxiway lead-off line.

[20] According to Mr. Lanter, the lead-off line between T/W A and runway 26 was painted in October 2001 when the runway was changed to daytime operations only. He stated it was to keep airplanes that landed on runway 08 from taxiing off onto the degraded runway shoulders.

[21] Measurements were taken along the centerline of runway 26 to determine the distances between the three lines. The distance between the lead-off line for runway 26 and lead-in line to T/W A was 42 feet. The distance between the lead-in line to T/W A and old (closed) T/W A was 67 feet.

- There were two unlighted[22] distance remaining markers on runway 26 showing "2" thousand and "1" thousand feet of runway remaining. The signs were not easily viewed from the van as it traveled on the runway centerline during the nighttime observations.
- When the van reached the intersection with runway 4/22 it was noted that the edge lights on the right side of runway 22 were noticeably dimmer than those on the left.[23]
- The lead-in line for (newly designated) T/W A led to the hold short position for runway 4/22.
- Old T/W A was closed and marked with low mass barricades with red flashing lights on the opposite side of runway 26. The red flashing bulbs were oriented perpendicular to the barricades, but were observed flashing from the runway 26 hold short position.
- Two-way blue reflectors were in place on the taxiway lead-in lines to T/W A and old T/W A but were not conspicuous to the group until pointed out by Mr. Coon. The lead-off line did not have reflectors.
- It was noted that there were two main gear tracks and one nose gear track in the grass beginning at the end of the pavement at the departure end of runway 26.

Figure 8. Photograph of the pavement configuration north of runway 26 at the time of the accident

[22] Both distance remaining markers had lights on the same circuit as the runway edge lights which had been turned off at the electrical "vault" since 2001.

[23] According to Mr. Lanter and Mr. Coon, this dimming issue occurred on two occasions. The first was the evening of August 25, 2006. NOTAM 1685 was issued stating, "runway 4/22 west side edge lighting, numerous lights out of service, UFN." The problem was corrected by an airport contractor the next day and the NOTAM was cancelled. The second event occurred on the evening of the NTSB taxi examination. NOTAM 1688 was issued stating, "runway 4/22 west side edge lighting – all lights dim UFN." The problem was corrected by an airport contractor the next day and the NOTAM was cancelled. According to Mr. Lanter, the dimming was caused by ground faults within the lighting system. The runway 4/22 lighting system cable, including grounding cable, was completely replaced on October 18, 2006.

6.2 Interviews

Mr. Martin Woodford
Project Coordinator[24]
Blue Grass Airport

Mr. Woodford stated that the airport began planning for the ongoing construction project in 2001. Runway 4/22 required repaving and an airport improvement project to upgrade non-standard runway safety areas (RSAs). Prior to construction, the RSA dimensions on the approach end of runway 04 were 106' in length by 500' in width, followed by a large dropoff. The RSA dimensions approach end of runway 22 were 92' by 500'. The airport's goal was to create as much RSA as possible on both ends of the runway. The project was to be done in stages beginning with a fill/retaining wall operation on the north end near Versailles Road followed by moving a creek and road at the south end. The runway would then be shifted 325' to the southwest to provide additional RSA at the north end where the old threshold markers were located.

Construction on the north end of 4/22 began early in 2004 and was completed in approximately summer 2004. The runway 04 localizer was on a pole structure off the runway 22 approach end. It was taken down and retaining wall was put up. The new localizer was installed on the retaining wall. The work created 275' of RSA on the north end. Also in the summer of 2004, work was shifted to relocate Cave Creek off the south end of the runway. Once Cave Creek had been established in its new location, work began to relocate Parkers Mill Road. Fill was added as well as embankments to support the runway 04 threshold. The work created 925' of RSA on the south end. The runway was then shifted 325' to provide 600' of RSA on each end. [An additional 400' of RSA was obtained via declared distances on the 7003' runway, leaving 6603' available for landing.]

The runway/taxiway separation at the approach end of runway 04 had been 300' prior to the construction project. The current standard was 400'; therefore, a "bubble" had to be constructed to increase the lateral separation to 400'. In conjunction with the embankment construction, a temporary medium intensity approach lighting system with runway alignment indicator (MALSR) was constructed utilizing the existing SSALR tower structures. The runway 04 approach end was remarked and the new runway 04 glide slope antenna was installed and flight checked on June 7-9, 2006.

Prior to beginning the repaving project, LEX wanted to keep at least one instrument approach on either runway 04 or 22 operational at all times. After the June 2006 flight check the FAA required the airport to remark the approach end of runway 04 to the old ILS position. The original plan discussed with the FAA was to temporarily keep the runway in the remarked condition (possibly through the winter) with the newly flight checked ILS operational. This would have provided a runway length of the 7328

[24] Mr. Woodford was an independent contract provider retained by the airport to provide RSA project coordination and communication. Mr. Woodford's services were retained in December of 2003 and his contract was reviewed and renewed on an annual basis from 2003 until present.

feet; however, the airport had no plan to publish the additional length. On approximately June 12, 2006, the FAA told the airport that there could not be 7328' of pavement because the runway did not appear that way on any charts.[25] The new glide slope was turned off, the new paint was covered, the old markings were repainted and the runway continued to be 7003' in length. Runway 22 continued to be the only precision runway until the weekend of repaving.

Runway 4/22 was milled and then repainted over two nights on the weekend of August 12, 2006. Four 15-foot diamond milling machines milled 30 feet on each side of the runway the first night and the rest the next night. The next weekend (8/18-8/20 6pm-6pm), the airport was closed and the runway was repaved and remarked to its ultimate final positions.[26] Taxiway connecters were redesignated and the signs were changed to A1, A2, A3, A4, A5 south of Taxiway C and A6 and A north of T/W C. (Old taxiway A north of runway 8/26 was closed with lighted, low profile barricades and old A5 was redesignated as A.) When the airport reopened on August 20, 2006, the ILS approach was 'flipped' to runway 4 and the runway 22 glideslope was taken out of service. On August 20, 2006, at 1405, the airport issued local NOTAM #A-1682 that stated "T/W Alpha north of R/W 8/26 closed UFN."[27]

LEX had always planned to barricade old T/W A north of runway 8/26 until a new A7 was constructed on the piece of land that was between old A and old A5, north of runway 8/26. Old A5 (new A) needed to be used for aircraft taxiing to runway 22 because old A went beyond the threshold end – hence causing problems with taxiing airplanes penetrating the runway approach area. It was not possible to keep it designated A5 because there was a new A5 on the south side of Taxiway C. Mr. Woodford stated that there were numerous discussions concerning the best way to redesignate old A5 prior to the construction of the new A7 north of runway 8/26. LEX and the FAA considered redesignating old A5 as A7; however, the new documentation (charts) showed A7 taxiing aircraft onto the painted runway numerical markings and this "may have caused confusion" among pilots. Mr. Woodford stated that "ATC had a problem with this." Eventually it was decided that old A5 would be redesignated 'A' temporarily before the new A7 was constructed.[28]

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[25] Email communication from Mr. Tommy DuPree, program manager of the FAA's Memphis Airport District Office (ADO), stated that the FAA objected to LEX's request because they would not have adequate safety areas for such operations. A request to interview Mr. Dupree was made to the FAA. As of the date of this report, the interview had not been conducted. A summary of Mr. Dupree's interview will be added to this report as an addendum,

[26] The centerline and touchdown zone lights were NOTAMed out of service at the time of the accident because of the milling and repaving project. The lights and cans had to be removed and new extension rings purchased. LEX was awaiting delivery of the new extension rings at the time of the accident.

[27] It was determined via contact with Louisville AFSS that the NOTAM was a local NOTAM. According to LEX, the NOTAM was sent to the AFSS, the airport ATC tower, and to airports tenants (including Comair) when it was issued on August 20, 2006. See Attachment 3. Group members noted that this local NOTAM was not present on the Comair flight dispatch for the accident flight. (See Operations Group Factual Report)

[28] There was a Remote Transmitter and Receiver (RTR) cable in the area where the new A7 was to be constructed and it needed to be moved prior to construction. That required a boring operation beneath 8/26.

The pavement configuration and signage in place on the day of the accident was not accurately reflected by either the National Aeronautical Charting Office (NACO) or the Jepessen chart. Mr. Woodford was asked about the discrepancy between the published charts for LEX. He stated that on August 2/3, 2006 the new Airport/Facility Directory (AFD) and NACO charts came out but the Jepessen airport and approach charts did not reflect the change. (Mr. Woodford stated that the FAA told the airport that because it was an enroute airport, which had a different publication date, and because the flight check showed a problem with one of the "markers" a change had not been made to the approach charts.) He stated that the Jeppesen chart had a scheduled revision 9/28 at which time he believed that the final airport configuration would be shown.[29]

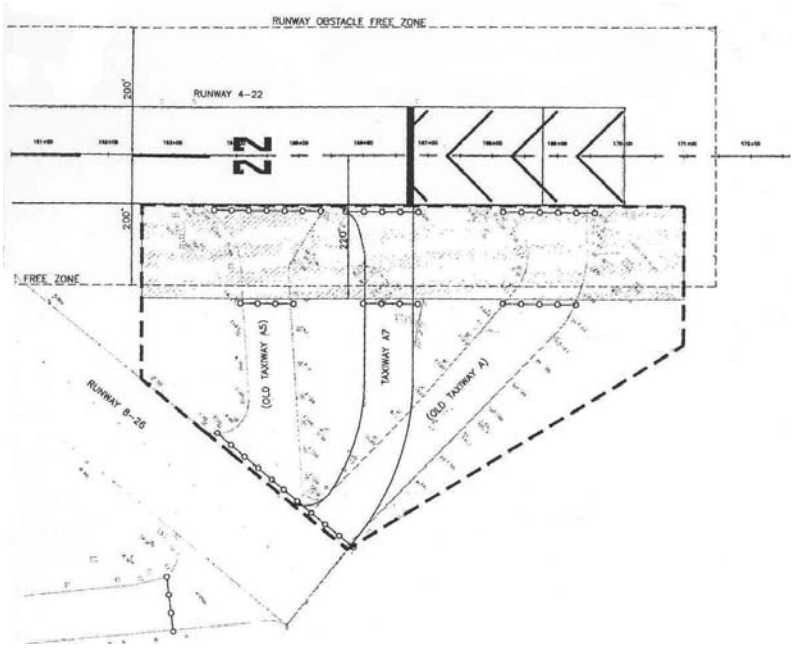

Figure 9. Diagram showing the locations of old T/Ws A and A5 and new T/W A7

Officer James "Pete" Maupin
Public Safety Officer
Blue Grass Airport

Officer Maupin had worked at LEX as a PSO for the past 12 years. Some of his duties included patrolling the airport perimeter, terminal, and ramp areas. He was cross-trained as a firefighter with EMS training. He was trained on all of the vehicles and equipment at the airport. He worked at LEX on a 24-hour shift; 8 hours as a police officer, 8 hours as an airport fire fighter and 8 hours rest.

The airport estimated that the project would take 30-45 days. After a delay due to the accident, T/W A7 construction began on October 2, 2006 and was completed on October 31, 2006. A7 was opened for use on November 1, 2006.

[29] For more information, see Attachment 7 for a written summary of project No. 0502-39 provided by Blue Grass Airport.

At the time of the accident, Officer Maupin was working as a police officer. He started his shift at 0430. He had gone to sleep at approximately 2230 on Saturday evening and awoke at approximately 0400. He conducted a runway and ramp check. He reported some runway lights and some overhead lights not working and included that information on his form.[30] He performed ID checks of several airline employees. He thought it was unusual that he observed a Comair employee in flight crew uniform who did a walk around, boarded one aircraft, departed that aircraft with his luggage and then boarded another aircraft that was the middle of three Comair aircraft on the ramp. He watched the loading of that airplane. A United aircraft pushed back and then he parked his Tahoe vehicle and went into the terminal. He was at the information desk when he heard the dispatcher call an Alert 3, aircraft down at the end of runway 08. He got back in his car and drove towards runway 08/26. He noticed his partner in another vehicle in the vicinity of taxiway C. He saw a glow in the distance and realized the accident was not on airport property. The two vehicles left the ramp through Gate 2 and drove around the loop to Man O' War Blvd. They turned onto Versailles Road and it started to rain. He could see a glow as they traveled on the road outside the airport property and it was getting brighter.

He went too far toward the Firefighting Training Academy and had to turn around on the road. He saw a Metro police officer going up the gravel road. Officer Sallee got to the road first and he radioed to tell the ARFF vehicles that it was the first road on the left after the airport. Officer Maupin reached the turn to the gravel road and waited for 30-40 seconds with his lights flashing in an attempt to show the ARFF vehicles where to turn. He thought that the directions Officer Sallee provided would be sufficient and also drove up the gravel road. He was trying to find the aircraft while driving through a large tall grass area. The grass was taller than the vehicle. He broke through the grass and saw his partner and the Metro Police Officer at the nose of the aircraft trying to pull a victim out. They asked him to bring his first aid kit and then he heard several explosions. He believed that most of the fire was at the back of the airplane. He did not hear any discernable sounds of life from the cabin nor did he see any other victims.

Officer Sallee and a Metro officer were able to free a male victim's body from the aircraft. He was "gurgling." It seemed that the "gurgling" was getting worse so they made the decision to put the victim in the back of Officer Maupin's vehicle. There was no time to wait for an ambulance. The victim had no shoes on and his legs were badly injured. His pants were torn at the knees and he had serious injuries to the left side of his face. Officer Maupin also stated his hips felt "bad." The victim was unconscious and

[30] During a follow-up interview, Officer Maupin stated that he began his check at the firehouse and drove down T/W A to the approach end of runway 04. He then drove the entire length of runway 04. He noted the following in his inspection log: taxiway connector sign 'A/A3' was not lit; blue taxiway light at the NE corner of A/A3 intersection was not lit; a light pole on the west side of runway 04 near A2 had been knocked over; the yellow 'A6' panel had fallen out of the frame (bulbs were still burning) on runway 22 near the VASI; and a blue taxiway light was out in the southwest corner of the T/W A and Runway 26 intersection. He provided GPS locations for each of the five outages and that information is included in Attachment 8 for the associated paperwork. The LEX repair log for the outages is included as Attachment 9.

estimated that he was 6'2" tall and weighed approximately 220 lbs. They tried to bandage his wounds the best they could. He remembered that prior to his departure from the scene that the E60 ARFF vehicle had arrived and was applying foam to the aircraft.

Officer Maupin drove, while the Metro police officer was in the back of the SUV with the victim. Officer Maupin drove as fast as he could to University of Kentucky Hospital emergency room. He considered stopping for an ambulance if he saw one enroute but decided it would be faster if he just kept driving. Both he and the Metro police officer instructed their dispatchers to inform UK hospital that they were enroute. As they got closer to UK, the Metro police officer said it sounded as if the victim was getting worse. Officer Maupin made the decision to drive over the curbs, shrubbery, and landscaping in front of the hospital to get him there as quickly as possible. Officer Maupin stated that they arrived at the hospital "before 0630." They waited inside while the emergency room staff worked on him. He said that he then called his Chief and spoke with the Chaplin. He later returned to the scene and stated that "it looked totally different." He did not remember a gaping hole in the airplane during the initial response. He remembered the airplane being whole with the front damaged.

Officer Jon Sallee
Public Safety Officer
Blue Grass Airport

Officer Sallee had worked at LEX as a PSO for the six months. He had been a police officer for 10 years and he is also a certified EMT.

His Saturday night shift was from 2300 to 0700 as a LEX police officer. He was at the terminal at 0500. He was patrolling inside the terminal and then got to the public safety office about 0530. His vehicle was parked outside the terminal. He got the Alert 3 call and got in his car and went out onto the taxiway through Gate 2. He could see the glow and knew it was too far away to get to from runway 08/26. The dispatcher opened Gate 2 and he followed Officer Maupin out. He continued to follow Officer Maupin onto Versailles Road. He took the first gravel road up the drive and told other units where the accident was located. He got near the barn and house and was flagged down by an individual who pointed him in the direction of the accident and told him to be careful of the horses in the field.

He observed that the field was on fire and he drove through the high grass. He parked near the accident site and could see an aircraft engine. He got out of his car and gave a report on the radio. There was grass over his head but he saw a Metro police unit. He came out of the grass near the nose of the aircraft and saw someone upside down in the front of the plane. He assisted the Metro officer and attempted to pull him out. He tried to pull on the seat belt but could not release it. He had the Metro officer lift up the victim's torso and he finally undid the rotary seat belt.[31] He was having trouble getting it undone because he was pushing for a release button. They then saw the arrow on the belt to twist for release. The victim had injuries to his head and "was moving a little bit." He

[31] Officer Sallee remembered only the lap belts being attached to the 5-point buckle.

did not have on any shoes. Officer Sallee tried to ask him questions but there was no response. The victim "just groaned."

Officer Maupin arrived with a first aid kit. Officer Maupin got in his vehicle and backed it up to get the victim in for transport to the hospital. Airport ARFF vehicle E60 arrived and started spraying AFFF on the fire. Officer Maupin and the Metro officer departed for the hospital together. More Metro police arrived and started a search for additional survivors. Officer Sallee saw two deceased victims by the fence near the front of the airplane. Their clothes were burned off and they were lying on their stomachs. Officer Sallee used the hand line from an ARFF vehicle to dispense agent. He worked the fire in front of the plane first. He directed E59 to fight the fire in the tail. He could not see much because the smoke was so thick. He eventually departed the scene at approximately 1000.

Officer Bryan Jared
Metro Police Officer
City of Lexington

Officer Jared had been employed as a Lexington police officer for seven years. He stated that the evening of the accident was busy. He was working the 2200-0800 shift. Things calmed down around 0330. Just before the accident, he was driving toward the airport on Versailles Road near New Circle Road. Two tones came over the radio with the message, "all available units proceed to LEX airport; aircraft down at airport; not sure where." He drove as fast as he could down Versailles Road. When he got to the intersection of Man O' War Blvd. there was an "instant downpour" but later he did not remember it raining when he got out of the vehicle at the accident site.

He saw an airport Tahoe police vehicle and figured he knew where to go so he followed him but could not keep up. The Tahoe got about a mile ahead of him on Versailles Road and he saw him make a U-turn and turn around like he was looking for the crash site. Officer Jared saw an area that looked brighter in the distance and turned left onto the first gravel road after the airport. The glow got "really promising" as he went up the road and then could see the fire. He was the first unit on-scene. He radioed that it was confirmed that a plane was down. He continued past the barn and drove in very tall grass and could not see where he was going. He broke through the tall grass and saw the site. There was a lot of debris and he decided not to drive anymore not knowing what he was driving over. He came out of the grass near the nose of the airplane. He did not see any other responders at the scene when he arrived. The "whole thing was engulfed." He could see fire inside through the windows. There was fire both inside and outside of the airplane. He believed that the cockpit was separated from the fuselage, but the fuselage seemed to be in one piece aft of the cockpit. He parked vehicle about 100' in front of the cockpit, at approximately the 2 o'clock position.

Officer Jared got out of his vehicle and went to the cockpit area. It was very hot but even hotter when not blocked from the fire by the cockpit structure. He looked for the pilot and he saw someone in the cockpit. He said that the victim "blended in" with

the wreckage and was difficult to see. His seat was "very torn up" and he was bleeding badly. His cheekbones were exposed due to facial injuries and fractures. He recalled that the injuries were mostly to the left side of his face. Both of his legs were also badly injured. The victim was hanging down from his lapbelt in a jackknife configuration. Officer Jared pulled on him but was unable to free him from the wreckage. He remembered something spraying on him.

Officer Sallee arrived and tapped him on the shoulder. Both of them starting tugging on the victim. Officer Sallee suggested that he push the victim's torso up and Officer Sallee was able to undo the rotary seat belt. The victim fell down but one of his legs (he believed it was his right leg) was still trapped in the wreckage. They had to jerk him two or three times to free the leg. He and Officer Sallee dragged the victim away from the wreckage. After a short distance Officer Sallee let go and went back to look for other victims. He continued to pull the victim away from the airplane. There were several explosions in the wreckage that he thought might have been the oxygen bottles.

Officer Maupin arrived on-scene. He told Officer Maupin to get his trauma bag. The victim was "gurgling" and Officer Jared realized he was still alive. He attempted to control the bleeding from his leg and face with gauze but there was too much blood. He knew he needed immediate medical attention and there were no ambulance on-scene yet. They decided to transport the victim immediately to UK hospital in the back of the Tahoe. Officer Sallee returned and it took all three of them to get the victim into the back seat of the Tahoe. He remembered that the area near the wreckage was very loud from the fire.

Officer Jared got into the back seat with the victim while Officer Maupin drove. A large, green airport ARFF vehicle arrived and started spraying foam from side to side while they were leaving the scene. He remembered foam hitting the Tahoe. Officer Jared stayed in the back seat with his hands on the victim trying to control the bleeding from his leg and face while Officer Maupin "drove like crazy" to the hospital. Officer Jared braced himself with his back to the passenger shield and his head against the passengers seat. He described essentially sitting on top of the victim to attempt to stabilize his position and to apply pressure to stem the bleeding. Officer Maupin was driving so fast that he was concerned about overturning the vehicle on the rough terrain. As they left, mutual aid vehicles were responding up the gravel road. Both he and Officer Maupin made radio calls to their dispatchers that they were transporting a victim to UK Hospital and to notify the hospital they were enroute.

When they got closer to the hospital the victim began violently coughing up blood. When they arrived at the hospital Officer Maupin drove over the curbs and through the landscaping directly to the ER door. He remembered that they drove by a UK officer who was on the phone just being notified of the accident. Officer Maupin and Officer Jared pulled the victim out of the truck and dragged him into the ER. They saw ER personnel on the "bat phone." He believed they were just receiving the accident notification. Hospital personnel immediately began to work on the victim and put him on a trauma bed. Officer Jared stayed at the hospital for an hour and watched them stabilize

him. The hospital prepared crash carts for a mass casualty event but no other victims arrived. He eventually returned to the scene and stated that it did not look anything like it when he first responded.

Richard Graham
Assistant Fire Chief
Blue Grass Airport

Assistant Chief Graham had been in his current position since May 1999. He started his shift at 1500 on Saturday. He worked at the fire house and went to bed around 0000 or 0030. His alarm clock went off and he was getting out of bed when he heard the crash phone for an Alert 3 and the lights went on. He jumped up, got his radio, put on his bunker gear, and got in E60 (LEX's red ARFF vehicle). When he left the firehouse he saw the fire in the distance and went straight out to gate 2 to get to Versailles Road because he knew the accident was not on airport property. He waited a very short time and the dispatcher opened the gate. E59 was right behind him. As he was driving out the airport "loop" he heard something over the radio that it might have been on airport property after all, so he sent E59 back onto the airport. He recalled a light mist but did not have to turn on the windshield wipers. The dispatcher called on the radio and asked about all-call and Asst. Chief Graham told him to do an all-call for airport personnel and call Metro Fire. Officer Sallee reported on the radio exactly where to turn - the first road past the airport fence. He drove up the hill and saw the airplane. He had no problems moving on the road. The first person he saw was someone from the farm who pointed to where the accident was. He drove through tall grass and the first thing he saw was a large fire and an airplane engine and part of the tail. He recognized it was a regional jet. It was dark and a light rain mist.

He saw two other vehicles on-scene. He placed E60 just behind and facing the airplane's nose. Officer Sallee was still at the nose of the airplane. He believed that the top of the airplane was gone and "the sides were pretty much gone too." But there was no fire in the cockpit area. He applied foam and Officer Sallee helped by directing him. After the fire was knocked down Officer Sallee pulled a hand line. He went down to replace Officer Sallee because Officer Sallee was not wearing any fire gear. E59 had arrived and positioned next to a piece of wing. They searched for victims and searched the cockpit again. They could not locate any other survivors. They located two victims along the fence line on the left side of the airplane. They were just a few feet away from the airplane. Metro Fire showed up and he told them that they needed to search for survivors from the aircraft and surrounding areas. He estimated that it took his vehicle approximately "eight minutes or less" to reach the accident site after he heard the Alert 3.

Mr. Ron Sapp
Communications Officer
Blue Grass Airport Operations Center

Mr. Sapp started working at LEX in 1992; worked about a year and then went to Metro Fire. He came back to LEX in 1999 and had worked as a communications officer until the present time. There were three employees that worked in the Operations Center on the day shift on weekdays, and two employees on the second and third shifts. Their duties consist of manning the communications desk, conducting employee fingerprinting and producing identification cards. On the weekends, there was one employee per shift for two 12-hour shifts.

He started his shift at 1900 the day before the accident. It was a quiet night. At 0100 there was a problem with a security alarm that was fixed around 0200. He performed the normal camera checks. There were 51 cameras on the airport. At 0609[32] the red crash phone rang with a message from the Air Traffic Control Tower (ATCT). They said that there was an Alert 3 and that a "Comair RJ that went down off the approach end of runway 08." He asked the tower to repeat it because the message's location confused him. The tower repeated the message and said that the exact location, souls on board, and fuel were unknown. (He explained that when the crash phone is picked up in the tower, a siren sounds at the LEX firehouse and the garage doors rise automatically at the same time as the communications center receives the call.) He hit the Alert 3 tone. He repeated the message he had heard from the tower over the radio per office policy because the officers in the firehouse often cannot hear the entire message because of the trucks starting. He then used the all-call system for an Alert 3 to all airport officers. He typed in Alert 3, "respond – don't call." He was just getting ready to call Metro Fire for mutual aid, when the phone rang and it was them. Metro Fire called because there was a 911 call to Metro Fire from someone driving on Versailles Road. He told them to respond with everything but he was not sure of the location. He told them that it was off the runway 08 approach end but that he did not know the exact location.[33] No other information was available. He contacted Comair Operations and they told him there were 51 individuals on board.

A short time later "the phones went nuts." "99.9%" of the calls were from the media. He received calls from all over the world including Holland, Japan, and Australia. Additionally all of the local and national news networks called. (When the airport administration offices are closed, all airport administration calls are routed to the communications center.) He had two phones with four lines each that were "lit up like Christmas." On a normal night he estimated that they received 10-20 calls. He received 10-20 calls a minute for the next 30 minutes. His relief was on his way to work to relieve him and usually arrives about a half-hour early for handoff. He did not know about the accident and called from Versailles Road to ask what was going on. Mr. Sapp said that

[32] The Computer Aided Dispatch report from the Operations Center is included as Attachment 10.

[33] Shortly after notification from the ATCT he used the on airport cameras to attempt to find the accident. He saw a glow on one of the cameras but did not report the location because he was not sure exactly where to direct the responding units.

he was needed immediately and he arrived at the communications center at approximately 0635.

Mr. Sapp believed that all incoming calls were recorded. The crash phone was tested every day at 0800.[34] He remembered that Officer Maupin called while enroute to UK hospital and asked him to call UK hospital to alert them that they were coming in. He attempted to reach the hospital but no one answered the phone. UK hospital called later to ask about a plane crash.

Observation of the LEX Communications Center

Several members of the Survival Factors group viewed the Operations Center where Mr. Sapp was working on the morning of the accident. The center is arranged in an L-shape configuration with computers, televisions, and telephones and other monitoring equipment. The room does not have a view of any of airport's taxiways or runways. It overlooks the ramp area near TAC Air. While there, the group compared the official Naval Observatory time (obtained via telephone) to the three time recording systems inside the communications center – the radio dispatch clock, the CAD log report computer clock, and the video clock. The results were as follows:

- The CAD system clock displayed exact Naval Observatory Time
- The radio traffic computer clock was 2 minutes 22 seconds slow compared to Naval Observatory time
- The time displayed on the video monitors was 3 minutes 8 seconds slow compared to Naval Observatory time

Mr. Rich Fosnot
Flight Safety Manager
Jeppesen Sanderson, Inc.

Mr. Fosnot stated that Jeppesen normally receives the information concerning changes to the National Airspace System from the National Flight Data Center (NFDC) of the FAA. (Some larger airports may contact Jeppesen directly regarding changes or large construction projects at their airports.) Jeppesen uses this information to publish changes in their manuals and databases with the effective dates provided by NFDC. Information changes submitted to Jeppesen are logged into a document control system. A daily report is produced from the document control system and new source documents are reported to an analyst for evaluation. This begins the process to make the necessary changes to charts and aeronautical databases.

Mr. Fosnot stated that Jeppesen staff had "no idea there was ongoing construction" at LEX at the time of the accident. Because Comair was a customer, Jeppesen staff reviewed the LEX chart shortly after the accident and noticed that it differed from the published NACO chart. (See Attachment 12) While investigating the

[34] A transcript of crash phone and radio communications following the accident was provided by LEX. See Attachment 11.

discrepancy, Jeppesen staff searched the document control system and discovered that a change had, in fact, been received concerning the LEX construction project from NFDC on June 23, 2006. (See Attachment 13) However, the change (to be effective August 3, 2006) had never been reported out to an analyst from the document control system. Jeppesen discovered that a software error was responsible for the data not being reported out. The change had been logged in on a weekend and the software had been designed to report out only entries made the previous business day, Monday through Friday. In addition to the LEX changes, Jeppesen staff also located six other source changes at other airports that had not been reported out due to the same error. Mr. Fosnot notified NTSB staff of the error on August 28, 2006, and Jeppesen published a corrected LEX diagram on their website the next day. The revised diagram was also made available to individual airline representatives on August 29, 2006. That updated chart was then included in the September 8, 2006, chart revision.

Mr. Fosnot stated that Jeppesen had various distribution methods for their charts. They still send out biweekly paper charts via U.S. Mail. Additionally, since 1998, "JeppView," an electronic airway manual service, had been available for subscribers on their website. Updates could also be received via U.S. Mail on a CD-Rom or, more recently, via a biweekly download from the Jeppesen website. JeppView electronic chart images also support Class I, II and III Electronic Flight Bags. Some airlines had electronic chart images delivered by a service known as "E-Link." Jeppesen can also provide paper and/or electronic "tailored coverage" for airlines that only service particular airports and/or use certain approaches. Comair was a tailored coverage customer and received biweekly subscription updates via U.S. Mail.

When asked about temporary chart revisions, Mr. Fosnot stated that Jeppesen does publish "yellow sheets," which is temporary information printed on yellow stock. They are used to alert pilots to: airport construction, temporary approach procedures, and special events. Email communication from Mr. Fosnot stated that, "When major runway construction is scheduled in pre-announced phases a temporary yellow sheet may be issued. Yellow sheets are not mandatory. The determination to publish a yellow sheet is usually made by the Revision Preparation and Planning team. This team evaluates all aeronautical source changes for chart revision activity." Mr. Fosnot stated that the decision to publish a yellow sheet is a completely internal Jeppesen decision and is somewhat dependent on how well organized and lengthy a construction project is. He also stated that the changes at LEX "would not have met the yellow sheet criteria" as there was no information about construction stages and dates available in the information received from the NFDC.

NTSB staff noted that the Jeppesen September 8, 2006 LEX chart revision included a note stating that runway 8/26 was "daytime VMC use only." Mr. Fosnot was asked about the lack of a similar note on the January 27, 2006 chart that was current at the time of the accident since that added information had been published in the AFD since 2001. Mr. Fosnot replied via email that he found no history of the note in their records and that they must have missed the publication of the note in a daily National Flight Data Digest (also issued by NFDC) in 2001.

7.0 Miscellaneous Information

The group obtained airport security camera video footage showing portions of the taxi and take off roll of the accident flight and the previous two flights. Four camera angles were obtained. Two show portions of the taxi; one of which shows a portion of the takeoff roll. Another view from the fire house security camera shows the glow at the accident site after the accident. A fourth camera angle shows the reaction of several ground personnel. GPS positions of the camera locations and the heights of the cameras above the ground were obtained and provided to the Aircraft Performance Group.

Jason T. Fedok
Survival Factors Investigator

Attachments

1.) Photographs
2.) Injury Chart
3.) Current (as of 8/27/05) and Selected Cancelled LEX NOTAMs
4.) Airport Master Records from 2001 and 2005
5.) FAA Letters of Correction for LEX Annual Inspections (2003/2004/2005)
6.) LEX Signage and Marking Plan (dated August 28, 2006)
7.) Summary of BGA Project No. 0502-39 (provided by LEX)
8.) LEX Inspection Checklist for 8/27/06 at 0514
9.) Photographs of LEX Repair Log
10.) LEX Operations Center CAD Report
11.) LEX Operations Center Radio Communications Transcript
12.) LEX Airport Diagrams
13.) FAA Email to Jeppesen (dated 6/23/06)