Attachment 1

to Operations Group Factual Report

DCA08MA098

INTERVIEW SUMMARIES

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Interview: Nate Bozeman – Mechanic, Mesa Air Group
Date: September 20, 2008
Location: NTSB Command Post Columbia Airport South Carolina
Time: 2030 EDT

Present were: Mark George, Dave Tew, and David Helson – National Transportation Safety Board (NTSB); Ed Grabman – Lear/Bombardier; Bob Jenkins and Todd Clamp – FAA;

During the interview, Mr. Bozeman stated the following information:

He said that the airplane cleaners, Frank and John, were nearby and may have also witnessed the accident.

Mr. Bozeman stated that he had heard the crew on ground frequency talking to ATC. He said they made a wrong turn and the ground controller gave them a back taxi clearance.

Mr. Bozeman was located next to the Doolittle hangar (now called the Mesa Hangar) and first saw the airplane just before taxiway Yankee. He said when he first saw the airplane, it looked like it was straight out from Eagle and it was already sparking. He said the airplane was coming down the runway with sparks coming off behind it "like a wheelie car". He thought at first the airplane was dragging the tail but the sparks continued all the way down the runway. It was the sparks that caught his attention. He did not see or hear engine reversers and could not hear engine noise. He stated that "it wasn't like the engines were screaming", the engines did not seem too loud and the engines did not sound like they were reversing with high power.

Mr. Bozeman said that the airplane did not appear to be going as fast as other airplanes usually are on takeoff. The airplane speed was more like a landing airplane appearing to slow down rather than accelerate. The airplane speed seemed constant, a little faster than taxi speed, maybe gradually slowing, and he thought the airplane was going to stop at the end of the runway.

Mr. Bozeman said he then heard a loud sound as if the airplane hit something when it went off the end of the runway and it looked like the nose gear collapsed when the airplane went off the end of the airport. He said he could not see the airplane after it went off the airport, he just saw an explosion and fire. He stated that he did not see fire before the airplane stopped at its final point, only sparking.

He said that he tried to call 911 but the phone kept ringing so he went inside and told his supervisor that an airplane had crashed. He stated that it seemed like it took a long time for the trucks to start going, like 4 or 5 minutes. He said it looked like the trucks were going down Alpha or Papa taxiway but he did not know how the trucks got to the airplane. He said that he was about ¼ mile from the fire station on the back side and he

could not see the fire station garage doors from were he was. He stated that he kept watching and saw fire and trucks, maybe city trucks, coming down the road.

He said they were still spraying water at 4 o'clock in the morning but he thought the fire lasted about 20-25 minutes.

Interview: Captain Charles Perrigoue - Global Exec Aviation Director of Operations
Date: September 21, 2008
Location: Airport command center
Time: 1300 EDT

Present were: David Tew, David Helson - National Transportation Safety Board (NTSB); Ed Grabman, Learjet Engineering Test Pilot, Bob Jenkins, Federal Aviation Administration.

During the interview, Captain Perrigoue stated the following information:

He had worked at Global Exec Aviation (Global Exec) since 2006 and had been the Director of Operations for about 20 months. During that time he said he had an excellent relationship with the FAA. He previously was a contract pilot for hire for about 10 years and during that time he had worked for Global Exec Aviation for about one year in 2004. During the time he was a contract pilot, he would occasionally work for some employers on a full time basis.

Global Exec Aviation had been in existence since 2002. He went to work with Global Exec in 2006 because the company was responsible, flew safely, and did not ask flight crews to do anything unsafe. Global Exec was owned by Ramon Manriquez. The company had 19 or 20 employees. It had 11 pilots and also utilized contract pilots. It had 9 airplanes which included 2 GIVs, 3 G3s (1159A), 1 Falcon 50, 1 Citation 650, 1 Lear 60, and 1 Conquest 441. He said the Conquest did not fly and was grounded by a supplemental inspection document (SID). The company managed airplanes for owners and all but one of the airplanes was available for charter.

Global Exec had operational control over all of its airplanes, paid for the insurance, and then billed the airplane owners. The owners had no input into the maintenance and operation of the airplanes. The accident airplane was owned by Inter Travel and Services located in Irvine, CA. Inter Travel and Services was a holding company for three airplanes including a GIV and a Citation 650. They mostly chartered their airplanes out but the owner had flown the airplane twice.

Some of the pilots used on the managed airplanes were paid by the owners but were trained through Global Exec with Flight safety conducting some of the check rides.

Captain Perrigoue said there was an Operational Control Special Emphasis group from the FAA that did a formal inspection on Global Exec and the results turned out good. A copy was forwarded to the POI.

Captain Perrigoue said he had about 6,400 total flight hours including about 3,700 flight hours as pilot-in-command (PIC), about 2,000 flight hours in Lear airplanes, and about 280 flight hours in the Lear 60. He initially completed training for the Lear 60 with a SIC restriction at Flight Safety in Tucson, AZ. He completed a recurrent/upgrade course on the airplane in August 2008 at Flight Safety in Tucson, AZ. The recurrent/upgrade training was done with the accident captain as his training partner. He had no problems during training and he stated that he had no previous accidents, incidents, or violations except for an airplane hydraulic system failure that occurred on a flight in a Challenger airplane.

The accident captain had been with the company since January 2008. She came to the company with excellent references and recommendations. Captain Perrigoue said that they normally gave a potential new-hire a check ride in a simulator, but the accident captain did not receive one because she was known to others in the company and she had flown with and had been recommended by a previous POI of the company. Captain Perrigoue flew with the accident captain about 30 hours and said that they were friends through work. Captain Perrigoue and the accident captain went through training together as two captains. She had no problems during training on the airplane. She was a little bit rusty on FMS procedures initially, but quickly got "up to speed". He was not aware of any accidents, incidents, or violations that the accident captain may have had. The Operations Specifications (Ops Specs) had limitations for new pilots but there were no written operational restrictions on the accident captain.

He was not aware of any personal or financial problems in the accident captain's life. He did not think that the accident captain had any physical or medical problems and was not aware of her taking any medication. The accident captain passed a drug test when she was hired. Captain Perrigoue said Global Exec had never had any drug problem. Global Exec performed a five year background check and the accident captain's results were very good.

Captain Perrigoue said that during Lear 60 training at Flight Safety he had about 20 hours of simulator training and the accident captain had about 16 hours of simulator training. He estimated that the accident captain had about 3 or 4 abort procedures during her training and he had about 6 or 7 abort procedures during his training. Flight Safety trained the same abort procedures as Bombardier Lear and neither of them had any problems during abort training. He said every abort they received during training was for a different scenario. The aborts were unannounced and "close to reality".

The accident captain also flew on the Citation 650 airplane and was an excellent pilot. Captain Perrigoue described the accident captain as "laid back" which was "typical of a less experienced captain". He said her decision making was excellent and conservative.

He said he would work on her being more vocal in her command authority but she was "above normal" for a new captain.

The accident F/O had about 8,000 total flight hours and had been with Global Exec for just a few weeks. He had previously flown Citation airplanes and helicopters and had also flown in the military and for the U.S. Customs Department. He came to Global Exec because the previous Lear airplane he had been flying was sold by the owner. He had been hired by Global Exec as a part time pilot to fly as an F/O. Captain Perrigoue said he thought the accident F/O had accepted a full-time position with another operator but he was not sure who it was.

Captain Perrigoue was not aware if the accident F/O had any personal or financial problems and said he had mentioned that he was flying "for fun". He was also not aware if the accident F/O was using any medications or had any drug problem. Global Exec performed a five year background check on the accident F/O. Some of the results of the background check were still pending however the responses the company received were all positive.

The accident F/O had no flight training on the airplane under Global Exec's training program. He had Lear 60 PIC and SIC flight training and a 293 competency check at his previous company, Executive Jet Management, which Global Exec and the FAA accepted. The F/O did attend Global Exec ground school which included basic indoctrination and procedures. Captain Perrigoue said he flew with the accident F/O for a few legs which totaled about 5 flight hours and said he was a well-experienced pilot with excellent pilot skills. He said the accident F/O had good CRM skills, had no problem "speaking up" but was not overly assertive. Captain Perrigoue said that during one problem they had, he worked well as a F/O. He said the accident captain and F/O had flown three legs together.

Captain Perrigoue said the Lear 60 procedures for an aborted takeoff were contained in the Quick Reference Handbook (QRH), the Pilot Training Manual, and the training program.

The abort procedures were:

- Either pilot announce the abort
- The pilot flying (PF) performs the abort
- Brakes apply
- Throttles to idle
- Spoilers extend
- Thrust reversers as required
- Check brake energy chart if required

Throttles to idle, brakes apply, and spoilers extend were immediate action items.

Pilots were trained at Flight Safety in accordance with Global Exec procedures. Captain Perrigoue had not had any actual aborts in the Lear 60. In his flying experience in all

airplanes, he had about 7 aborts in the low speed regime. He had two high speed regime aborts in other airplanes. One high speed abort was due to a nose wheel steering problem on an older Lear and the other was due to a thrust reverser unlock on a Hawker airplane. Both aborts were successful.

Captain Perrigoue stated that the following criteria were trained in regards to an aborted takeoff:

- Abort prior to 80 knots because of any abnormality
- An abort after 80 knots but prior to V1, would be due to any fire, engine failure, inadvertent thrust reverser, or loss of directional control.
- An abort after V1 was not trained. Once you reached V1, you removed your hand from the throttles and continued the takeoff.

Captain Perrigoue said the Airplane Flight Manual (AFM) and the Pilot Training Manual contained a discussion of reasons to abort. Tire failure was not specifically discussed as criteria for an abort but could be part of a directional control reason to abort. He said that company training does not discuss dual tire failures. He stated that in addition to the training manual, the company used a Boeing video which discussed statistical safety on high speed abort. He said the message communicated by the video was "do not do high speed aborts".

There had been a debate over spoiler use during an abort. The spoiler system was armed prior to takeoff and when there was an abort, when there was wheel spin-up, the spoilers would activate when the throttles were retarded to idle.

He said the accident airplane was less than a year old when Global Exec acquired it from the previous owner in October 2007 but did not operate it for charter until August 2008. He had flown the accident airplane for all but three legs since the company had owned the airplane. He estimated he had flown about 20 legs in the airplane.

Captain Perrigoue said the accident airplane was changed from a two rotor brake system to a three rotor brake system while he and the accident captain were in training in August 11-16, 2008. Global Exec changed the brakes to a three rotor system to increase performance. The three rotor braking system had significant improvement in stopping ability, was much cleaner, and did not give off as much dust. He said the brakes that were removed were in a "nearly new" condition.

Captain Perrigoue was not aware of any special concerns about tires on Lear airplanes but occasionally there had been problems on Lear jets with tires being worn or having low pressure. He said he had seen airplanes lean because tire pressure on one side was lower than normal. He said pilots checked the condition of the tires and for any abnormality on the tire or the wheel prior to every leg. The company had placed a special emphasis on inspecting the tires since they had changed to the three rotor braking system and company pilots had found no problems with the tires. He said that maintenance checked the tire pressure as part of normal maintenance and that there was no requirement for crews to

check the tire pressure. He was not aware of any recommendation letter or document requiring extra inspection of tires.

In regards to quick turn around weight limits, Captain Perrigoue said you could be below all aircraft limits and still exceed the quick turn around weight. Lear recommended a minimum of 20 minutes turn time. He said if the airplane landed above the weight in the maximum turn around weight limit chart, a minimum time of 20 minutes must be observed and the maintenance manual must be checked prior to the next departure. He said if he had to use maximum braking, he would check the turn around weight limits chart before takeoff. He said he almost never needed to use braking during landing as the airplane had very effective thrust reversers.

Captain Perrigoue said that the engine reverse thrust was automatically scheduled based on airspeed. He said the Lear 60 gave you a more noticeable forward thrust effect than the other Lear models when you stowed the reverse thrust levers. Unlike some other airplanes, he said the Lear 60 reversers were stowed while engine power was high and the stowing could translate into forward thrust if the reversers stowed quickly.

During reverse thrust, you would first see two amber thrust reverser lights located on the glare shield annunciator panel. These lights indicated that reversers were in a position other than stowed. You then got two white deploy lights on the glare shield annunciator panel which indicated the reverser was fully open. The pilot could then hear the balk solenoid retract and then the N1 bugs would re-sequence to max reverse. The required callouts were “two unlocked” and “two deployed”. When the unlock lights came on and other conditions were met, the engines would be at idle thrust. Thrust was then increased by pulling the reverse levers up and back.

Captain Perrigoue said that he was aware of a few previous maintenance items on the accident airplane and that all had been resolved. He said the accident airplane had previously had a right hand thrust reverser unlock light slow to extinguish during a required pre-departure thrust reverser check. Maintenance adjusted a micro switch to fix the problem. It had just been an indication problem and they had not had any more problems with the thrust reverser. On December 8th, 2007, the airplane had a door seal malfunction on a flight from Garden City, KS (GCK) to Teterboro, NJ (TEB). Maintenance reglued the seal to fix the problem. On September 12, 2008, he flew with the accident F/O on a scheduled flight from Teterboro, NJ (TEB) to Tulsa, OK (TUL) on the accident airplane. On that flight, they had a dual bleed air overheat when a high pressure bleed valve stuck in the on position. The flight returned to Teterboro. Captain Perrigoue then flew home to California. The accident captain and F/O commuted to TEB on September 17th, and conducted a test flight on the accident aircraft at about 1200 EDT on September 18. The test flight lasted about 48 minutes and the results were satisfactory.

Captain Perrigoue said that on September 19, he talked to the accident captain several times during the day. Captain Perrigoue said he informed the accident captain that she would depart out of Teterboro Airport (TEB) at about 2130 EDT to reposition to

Columbia Metropolitan Airport (CAE) for a brokered charter flight. The actual departure time was 2142 EDT. He asked if she felt rested and comfortable to take the flight and she responded "yes". He said the accident captain received weather information from Honeywell flight following and pilots called for notification [flight following] prior to every leg. He said he did not know why the flight was brokered to Global Exec by Clay Lacy Aviation.

Interview: Edward Grabman – Senior Engineering Test Pilot Bombardier / Lear Jet
Date: September 21, 2008
Location: NTSB Command Post Columbia Airport South Carolina
Time: 1630 EDT

Present were: Dave Tew, and David Helson – National Transportation Safety Board (NTSB); Bob Jenkins – FAA; Charles Perrigoue – Global Exec Aviation

During the interview, Mr. Grabman stated the following information:

He had worked for Lear for about 17 years. He stated that he had held his current position as Engineering Test pilot for about 13 years. He previously held a position as a Production Test Pilot for about 2 years and a Flight Test Engineer for about 2 years.

Mr. Grabman stated that he had accumulated approximately 7,000 hours total time in airplanes including approximately 4,000 hours PIC, approximately 3,000 hours in Lear Jets and approximately 600 hours in the Lear 60 (accident airplane). He stated that he does not currently perform any training or checking duties in Lear Jet airplanes.

Mr. Grabman stated that he was not aware of any previous problems with Lear or specifically Lear 60 airplanes concerning rejected take off accidents. He stated that he was aware of some accidents but not any details. He thought maybe a few over the last 3-5 years but he was not aware of any particular problem that the company was required to address.

He said that he could recall that there was an engineering change to the squat switch related to reverser deployment on landing but not takeoff. He stated that there were no mechanical or procedural issues that he was aware of regarding the Lear 60.

Mr. Grabman said that he thought if the reversers were deployed and then the squat switch went to air mode, the reversers should stow and the engines would go to forward thrust instead of reverse thrust. He stated that he was aware of a few reported instances of this and he referred to an accident in 2001. He was not aware of any problems where thrust was not responsive to throttle movement.

In regards to General Operational issues, he stated that there had been some discussion on whether tire pressure was being checked on airplane preflight inspections. He said the

discussion was based on the difficulty in determining tire pressure by visual inspection on airplanes with dual wheel landing gear. He stated that he was not aware of what started interest in this area and he was not aware of any specific recommendations from Lear on this subject.

Mr. Grabman was not aware of any design issues with the Lear 60 except that there was a redesign of the brakes. He stated that the 2 rotor brakes had excessive wear issues and that they required an inspection after every 25 landings. He stated that there was an airworthiness directive (AD) issued for the 2 rotor brakes. The company responded to the AD by redesigning the brakes to a 3 rotor brake.

Mr. Grabman stated that he had no knowledge of any significant operational issues. He stated there have been communications with operators but that there were no" hot items". He stated that he was involved in basic engineering testing of the Lear 60 back in 1993-1995.

He stated that he had no knowledge of any issues with the bleed air system on the Lear 60. He stated that he was not aware of any problems with any other brands of tires approved for use on the Lear 60 and that he did not know which other brands of tires were approved for use on the Lear 60. Mr. Grabman stated that he was not aware of any higher than normal tire failure rates on Lear 60 airplanes and he recommended that we speak to their company Field Service Representative, as he might have more information regarding tire brands and whether there were any issues with them.

Mr. Grabman stated that he had no knowledge of any issues with the FADEC system on the Lear 60 airplane. He stated that the Lear 60 had been in service for 15 years, it was certified in 1993. He said that he did not recall ever hearing of problems where the engine controls failed to a high setting. He said that he had heard of occurrences where the engine failed to idle (went to idle), or failed to off.

Mr. Grabman said that he left Bombardier for a short time about three years ago to work for Eclipse for about 6 months. He said, at the time, Lear was downsizing with no new airplane on the horizon. Eclipse did not live up to his expectations regarding flight testing so he returned to Bombardier. He stated that he had heard that the Eclipse engine control failure was caused by pushing the thrust levers past the point that the software was designed for.

Mr. Grabman stated that the Lear 60 has a dual channel FADEC design as a safeguard. He stated that a failure of one channel of the FADEC would result in the system auto switching to the other channel and that any major failure of the FADEC would be annunciated. He stated that the channel switching would also occur for some faults in the active FADEC channel. He said he could not recall the exact criteria for channel switching in normal operations because there are different models and some auto switch at engine shut down. He said that he was not aware of any dual channel failures of the FADEC system and he stated that he was not aware of any FADEC failures that would

cause loss of engine control in ground mode without being annunciated - only failures that would not be related to thrust control such as failure of redundancy.

He said that he was not aware of any FADEC commanding APR when it was not intended. He said he was not aware of any occurrence when FADEC commanded APR (Automatic Performance Reserve) when thrust reversers were engaged in the air or ground mode and that he did not know if it was possible.

He said that he believed the MCR, MCT, TO, and APR settings on the thrust lever quadrant were based on power lever angle (PLA) through use of a linear variable displacement transducer (LVDT) rather than micro-switches in the detents.

He stated that he did not know if it was possible for max thrust to be commanded if the data from the squat switches was removed.

He said you get thrust levers out of cutoff by pushing the thrust levers forward and that they can be pushed all the way forward without restriction.

He said he had never shut down both engines at the same time using one hand, that he had always moved them to shutoff one at a time. He stated that he had seen people shut down both engines at the same time using both hands. He had never shut down engines in a hurry in a high workload situation without using a checklist or procedure. He said he had shut down an engine in flight using a checklist. He said that it was not something he had been trained on or discussed, and that a checklist or procedure should be used. He said that if engines were shutdown while the airplane was in motion, some systems would be affected such as electrical, hydraulic, or bleed air.

Mr. Grabman stated that if both engines were shut down while the airplane was in motion there would still be some stopping ability. The accumulator pressure would allow some braking from toe brake pedals, possibly 6 applications before complete loss of hydraulic pressure. He stated that he would have to look in the manual to confirm the number of available brake applications. He stated that the emergency brake handle would also still be functional. He stated that during training there was no discussion of shutting down both engines at the same time while the airplane was in motion.

Interview: Michael Nash– current POI of Global Exec Aviation
Date: September 22, 2008
Location: Phone interview
Time: 1430 EDT

Present were: David Tew, David Helson - National Transportation Safety Board (NTSB); Charles Perrigoue – Global Exec Aviation; Ed Grabman – Bombardier Lear

During the interview, Mr. Nash stated the following information:

He had been an employee of the FAA since June of 2006, and the POI of Global Exec Aviation since November 2007. Mr. Nash also stated he was assistant POI for Global prior to his assignment as POI. Mr. Nash indicated he was an employee of Flight Safety for about one year prior to working for the FAA. Prior to that he said he was the Chief Pilot for a Part 135 operator, with oversight of about 30 aircraft, for about 6 years. He indicated that the fleet was mixed with both turboprop and turbojet aircraft. He stated he left due to the high workload. Prior to that he stated he was a flight instructor and director of maintenance for a local flight school.

Mr. Nash stated he was POI for three other certificate holders, which consisted of one small piston operator, one small turbojet operator and one mixed small turboprop, and turbojet operator. He stated Global was his largest operator. He did not have an assistant. He stated 40% of his workload comprises part 135 operators, and 50% of said work was in relation to Global.

Mr. Nash stated that he visited Global Exec Aviation on average about once a month. He stated all planned (P) and required (R) items were completed for fiscal year 2008. He further stated he had added some items and they were completed as well.

Mr. Nash stated in regards to his oversight of Global Exec Aviation that there was "nothing notable", but some small items with paperwork, and clerical errors. He was not aware of any enforcement actions.

He stated he was onboard Global airplanes "four or five times" in the past year, but not on the Lear 60. He said he observed Sarah Lemmon on a 135.299 line check flight in the CE-650, as an observer. He stated he had never been on the CE-650 or met Captain Lemmon so he wanted to observe. He stated the check was conducted by Inspector Steve D'Urso on May 6th, 2008. He said the reason for this arrangement was due to the lack of a qualified local inspector, as this was Ms. Lemmon's initial line check. Mr. Nash said the check was "fine, satisfactory, nothing of note." He said her flying was fine; she seemed to know the airplane and was well prepared. He stated he "felt comfortable" that she was prepared. He stated he had never heard her name in context with Global's operation. He stated he believed she was working on a company specific checklist for the CE-650.

Mr. Nash said he had not personally met First Officer Bland, but had reviewed his records, and determined they were in order. He added he worked closely with the Director of Operations regarding pilot qualification, and such an arrangement was normal. Mr. Nash indicated he did not monitor his other operators as closely as they were very small and local. He stated he wanted some familiarity with "names and planes."

He said he had not generated any letters or actions regarding Global. He said any corrections that were necessary were usually made "on the spot." He said he tried to ride on Global's aircraft once a year, and had observed all global check airmen yearly however did not observe Flight Safety check airmen or travel to other Flight Safety locations. Mr. Nash said due to time and cost he did not travel or observe Flight Safety

check airmen. He indicated he reviewed oversight of Flight Safety by other FAA employees. He stated he would become aware of this observation because the FAA inspector who conducted the observation would be noted in the training or checking records. He further noted that there had been no failures for the company or this crew. Mr. Nash said he was not aware of any accident, incident, or event concerning Global.

Mr. Nash stated that the Global Exec training program was "pretty standard" and he approved the program with no concerns. He said manuals were provided by Flight Safety and were aircraft specific.

Mr. Nash said the previous POI Mr. Gary Lackey had not expressed any concerns to him regarding Global Exec. He stated there were no changes with the oversight and that the transition was seamless.

Mr. Nash said he had no concerns with Ms. Lemmon as either a PIC or pilot. He further stated she was a graduate of Stanford, well educated, and a "very sharp gal."

He said he was aware of an additional inspection of Global Exec, and that there had been an emphasis on operational control. Mr. Nash stated he had seen Global's operational control system in action, and had no concerns. He further noted that the results of that inspection were "great", and that the inspection was conducted by the FAA Operational Control Group from Washington D.C.

When asked if he had recommended any changes to Global, he replied that Global needed bigger offices.

Mr. Nash said that Global's Training Manual changes were approved by the FAA POI. He indicated his interaction with regard to the training program was limited to Global, not Flight Safety. Changes to the program were always by letter and were reviewed by the POI prior to approval. Recent changes to the program included the addition of the Learjet 60, and were "standard." Mr. Nash said that Global had a procedures manual that was company specific and accepted by the FAA. He noted any errors with the manual were small and mostly clerical. He indicated that Charles Perrigoue the Director of Operations had worked diligently on the manual for a long time, and submitted a "quality product" for acceptance. He said Global had completely re-written the manual in November 2007 and that they revised their manuals approximately once per year. Mr. Nash said the company manuals had not contained any take off abort procedures. He stated that those procedures were contained in the training program, and covered in actual training. He stated that the specific abort criteria were listed in the Flight training manual issued by Flight Safety.

Mr. Nash was asked if he had any negative comments regarding Global. He replied that Charles Perrigoue sometimes became agitated or frustrated by the slow pace or lack of response by the FAA. Especially with regard to Sarah Lemmon's line check. He stated the check was requested in February of 2008, but not performed until May 2008. He noted some clash of opinion with the delay. He said there was "no reason" for the delay

but it was mainly because no resources were available, and that he tried to facilitate. He said Inspector Dennis Fogarty also "tried to help" with Sarah Lemmon's line check but was unsuccessful.

Mr. Nash said he knew the owner of Global Exec and that he had observed the owner on a line check, and interacted with him in the office. He stated he had no ownership concerns, and that Global's integrity was never in question. He further stated he had no concerns with Global's Safety culture.

Mr. Nash said he noted Sarah Lemmon was nervous about her line check but he thought that was normal considering the presence of two FAA inspectors.

Interview: Gary Lackey – former POI of Global Exec Aviation
Date: September 22, 2008
Location: via telephone from NTSB command post, Columbia, SC
Time: 1530 EDT

Present were: David Tew, David Helson - National Transportation Safety Board (NTSB); Charles Perrigoue – Global Exec Aviation; Ed Grabman – Bombardier Lear; Todd Clamp – FAA.

During the interview, Mr. Lackey stated the following information:

Global Executive Aviation of Long Beach, CA was a 14 CFR Part 135 Operator. Mr. Lackey had been a Principal Operations Inspector (POI) at the Long Beach FSDO and currently was assigned as POI to fourteen operators; half were rotorcraft and half fixed wing. Three of the operators were fairly large. (1) West Coast Charter had 25 airplanes and 60 pilots, (2) Mac Air, (3) ARI. He said Mac Air and ARI were companies similar to Global Exec Aviation.

He stated that he was the POI for Global Exec for one year and was the Certification Program Manager (CPM) for the certification process at the time of original certification. After he was the POI for one year, the certificate was transferred to Inspector Bob Woods.

Inspector Lackey stated that he had no concerns about the company training, manuals, or operations. He said the management was impressive and took care of the safety aspect which was hard for a Part 135 operator to do and not get "hung up" in the dollar amounts. He said he gave route checks to some of the pilots. He said that he did about 2 or 3 line checks a year on Global Exec. He observed international operations training at Air Flight. He did not recall doing any oversight of their training. He said the oversight of training was left to the program manager of the flight training facility. He said he received copies of the training records and he looked at the pilots files. He said he usually got a report from the 142 school concerning training. He did not recall if there were any failures that Global Exec pilots had. He did not recall anything "dramatic"

about the company from other FAA inspectors. He said that Global Exec was one of the top two in the area for procedures, safety culture, and management. He said the company ran a good operation, had good management, and had no incidents. He stated that he would always find a few errors in the Global Exec manuals just like he would in every operator, and that the company always took prompt action to make corrections. He stated that their safety culture had always been good.

He stated that Global Exec Aviation was one of the first to receive an Operational Control national inspection-Go Team from Washington and the results of the inspection on Global Exec were favorable. The inspection occurred because the FAA was concerned that owners were doing "lease-backs" and there could be a problem with operational control. At the time of the inspection, the Southern regional manager was involved in the Southwest Airlines scandal and the FAA was concerned the POI would tip off the company.

He said the training at Flight Safety, which was a Part 142 operation, was "under fire". The FAA was trying to put the training and checking responsibilities under a POI. Flight Safety provided good training for abnormals and emergencies, but the rest was "cookie cutter". They were trying to make it more company specific. He said the operator was required to audit training and to require that training was operator specific. He said training was changing and the changes were good. Some changes were to have the company involved in the 142 training ensure the 142 training was to company procedures. The 142 schools were more into training their instructors on companies' procedures.

He also elaborated that the aborted take offs were never practiced enough in any operation and was only done on flight evaluations. He stated that he always made this a practice to check a pilot on aborted takeoffs during every evaluation that he gave. He said that he had always been a believer in doing more abort training that is unannounced. He felt the pilot was always aware that an abort was coming due to the way that a check ride was conducted. They needed more aborts in the airplane. An aborted takeoff in the simulator was very different than one in the actual airplane. In the airplane, pilots had a sense of denial about an abort. He felt simulators did not do a good job of replicating airplane movement in ground operations. He said he had not made any recommendations for changing training for aborts. He said he had never observed any aborted takeoffs at Global Exec Aviation.

He said that about 2 years earlier, a Lear 50 lost a tire on takeoff and that there was apparently a tendency for the tires to come apart. He said he knew of 2 other similar events. He said another pilot was aware of several events where the Lear had tires blow. He said the Lear had "tiny tires" that looked "too small for an airplane".

Interview: Steven D'Urso –POI/Air Safety Inspector –Scottsdale, AZ FSDO
Date: September 22, 2008
Location: Phone interview

Time: 1630 EDT

Present were: David Tew, David Helson - National Transportation Safety Board (NTSB); Charles Perrigoue – Global Exec Aviation.

During the interview, Mr. D'Urso stated the following information:

Mr. D'Urso stated he was with the FAA for twelve and a half years, and 10 years in that capacity. He stated he was the POI for Swift Air, one company that held several part 121 and 135 certificates.

He stated he was qualified on the CE-650 since 1991, and that it was his first type rating. He stated he had approximately 8,000 total hours, 7,000 hours as PIC, and 2,000 hours in the CE-650. Mr. D'Urso said that he had given over 100 check rides in the past year and that he was very busy. He said he had issued very few failures and that the failure did not happen very often.

He said he gave a line check to Sarah Lemmon because he was qualified on the CE-650. Mr. D'Urso said that Sarah Lemmon was a bit nervous, but the check ride was simple and he said "she did fine". He noted he believed her hands were shaking. Mr. D'Urso said there were no abnormal or emergencies during the check. He further stated that check flight lasted approximately five or seven tenths of an hour. He stated her performance was satisfactory and that he had no concerns.

He said there were some minor issues with the checklist. He said she used the factory checklist which was lengthy and cumbersome. He suggested creating a company checklist. Mr. D'Urso said she showed good judgment and stated he would not hesitate to "put his family in the back" with Sarah Lemmon flying. Mr. D'Urso said Sarah Lemmon conducted a pre departure briefing and that it was adequate.

Mr. D'Urso stated that Mr. Michael Nash accompanied him on the check flight. He said he did not perform an oral examination, but did conduct a briefing. He said he did not conduct a post flight de-briefing, because there was nothing remarkable to discuss and Mike Nash did not have any comments either.

Interview: Wilberg Morales
Date: September 22, 2008
Location: Columbia Aviation FBO
Time: 2100 EDT

Present were: David Tew, David Helson - National Transportation Safety Board (NTSB); Charles Perrigoue – Global Exec.

During the interview, Mr. Morales stated the following information:

The passengers for the outbound flight came into the Columbia Fuel facility and were offered coffee and candy.

He said that when the accident airplane taxied in, the male pilot was in the left seat. The airplane arrived about 15 minutes later than expected and he said it seemed like the pilots were "maybe in a little bit of a hurry". He said the male and female pilots both looked "normal". The pilots were "nice" and did not seem tired.

He said the pilots told him to "top the airplane off". He saw the male pilot talking to someone on the phone. The male pilot closed up the fueling panel after the fueling was done then he went inside and paid for the fuel.

When he had finished fueling the accident airplane, Mr. Morales told the passengers that it was okay to board. He said that when the accident airplane departed, the female pilot was in the left seat.

Mr. Morales said he was topping off the fuel truck at the fuel farm when he saw the accident airplane and noticed that there were a lot of flames on the bottom of the airplane. He initially heard a loud noise like a flat tire that caught his attention. He saw the accident airplane cross the road and hit the hill on the other side. After the airplane hit, the tail of the airplane dropped and then the airplane went a little further up the hill. He saw some people come out of the door of the airplane.

When he first saw the airplane on the runway, he said it sounded like an "old airplane" because of the noise it was making. He said it sounded like a truck going down the highway with a flat tire.

While standing where he had seen the accident airplane on the runway, Mr. Morales pointed out what he saw and said he first saw the airplane at a point where the runway ended. He said he saw the airplane skid along the ground and go down toward the road before impacting the hill. He said when he first saw the accident airplane, it was going across the ground flat and the nose was down as it was normally when on the ground.

Interview: Joseph Peter Sciabarra – Lear 60 Ground / Simulator Instructor and TCE, Flight Safety International, Tucson AZ
Date: September 23, 2008
Location: via telephone from NTSB Command Post Columbia Airport South Carolina
Time: 1235 EDT

Present were: Dave Tew, and David Helson – National Transportation Safety Board (NTSB); Charles Perrigoue – Global Exec Aviation;

During the interview, Mr. Sciabarra stated the following information:

He had been employed by Flight Safety since June 1999. He stated that prior to that he was in the Navy for 30 years flying the Strike Fighter and was a test pilot for F14 and F18 airplanes. He stated that he had about 5,600 hours total time mostly in military airplanes.

Mr. Sciabarra said that he remembered Captain Lemmon and stated that she and Chaz (Charles Perrigoue) were in his ground school. Mr. Sciabarra said Captain Lemmon did stick out in his mind because they did not have many female Lear 60 pilots that came through training. He stated that he did not remember Captain Lemmon having any problems in training; she was very meticulous, and had good organizational skills using note cards to study.

He said that he did Captain Lemmon's recurrent simulator training. She did 3 four hour sessions, spending 2 hours in each seat for each session. He stated that was the required amount of time for a recurrent simulator program and that if students needed more time they gave it to them.

He said that he asked Captain Lemmon how she was doing flying the airplane and she stated that she had not been in the airplane for a while. He said the first simulator session was a little rough on basic air work but by the end of the 1st session she was doing well. Mr. Sciabarra described basic air work as step turns, approach to stalls, and unusual attitudes. He said the 2nd and 3rd day went very well.

Mr. Sciabarra said the second session consisted of abnormals such as engine failures, thrust reverser unlocked, approaches; low ceiling and visibility, V1 cuts, and aborted takeoffs with engine failure or thrust reverser unlock scenarios.

He said they also do more abnormals in the third session. He said she was given one aborted takeoff scenario in session two and one aborted takeoff scenario in session three for a total of two aborted takeoff scenarios. He said she also saw abort scenarios when her training partner had them when she was the non flying pilot. He stated that his notes of her training said that she had good control of the airplane especially on V1 cuts.

Mr. Sciabarra said the training program required aborted takeoffs triggered by an engine failure and by a thrust reverser malfunction but they sometimes did other scenarios such as weather. He said they occasionally give a tire failure and/or a hydraulic failure scenario with a more experienced pilot but that they did not have time to cover every scenario with a new pilot.

He said that the simulator could replicate a brake failure but that he did not recall if that resulted in a loss of braking or a locked up brake. He said the simulator could also replicate a blown tire or landing gear failure.

Mr. Sciabarra stated that the third session included engine failure at V1 during take off, crosswind takeoff (with wind at 15-18 knots), rejected takeoff prior to V1, and various approaches including a circling approach.

Mr. Sciabarra said that he had no concerns about Captain Lemmon's flying ability. He said that her first day was just a little rough. He said that in his notes he marked her as having had good CRM skills and good control of the cockpit all three days.

He said he didn't recall any specific areas that she required improvement in. He said in his day two notes he wrote "excellent CRM" and stated that he does not usually give that rating to many people. He said that his notes on day three indicated that she had completed all training requirements, had good control of cockpit, good CRM and recommended for check ride.

Mr. Sciabarra said that in the classroom he spent time discussing the importance of checking tires during preflight, and the importance of checking tire pressure. He said he taught students that a blown tire was something you needed to plan for and think about before it happens because they would not have time to think about it when it did happen. He said he taught them the same thing for thrust reverser unlocked scenarios.

Mr. Sciabarra stated that he focused on that because he used to fly the A-7 which was prone to blown tires and that experience shaped his lessons. He said that in training he mentioned a handout from Goodyear recommending that tire pressure be checked before flight. He said he also talked about the Lear 60 manual that covered that same topic. He stated that he remembered a Lear 60 accident that had a blown tire that caused "other things", so he mentioned that in training as well. He said he usually spent only a few minutes on this subject but may spend more time if the lesson elicited a response or questions from the students.

Mr. Sciabarra stated that he also remembered giving Captain Lemmon her initial type rating check ride back in October of 2007. He said he remembered everything being within standards and did not remember anything out of the ordinary. He said she was working for a different company then and checked his records to confirm that it was Airlink Airways. He said he remembered that check ride very well because there were not that many female Lear 60 pilots.

Mr. Sciabarra stated that Captain Lemmon did not seem more nervous than most people on a check ride. He said she was not nervous enough to affect her performance. He said she had no outward signs that she was nervous and her performance of immediate action items was within standards. He recalled that they had covered fires, go-arounds and others and that he did not recall any problems. He said she did not require any coaching from the First Officer and said he did not recall if Captain Lemmon would defer to the First Officer for any decision making.

Mr. Sciabarra said that all the check airmen there gave the same check ride and that he did not pre-brief aborts. He said students knew that they are coming but he did not tell

them when ahead of time. Mr. Sciabarra said he did not recall having to fail any students in the past few years. He said Flight Safety gave people additional training if they need it before sending them to a check ride.

Mr. Sciabarra said he was required to get in the airplane one time each year but not necessarily fly it. He said he had not flown the Lear 60 for about 2-3 years.

He said he had not heard of any tire concerns with the Lear 60. He said he had been concerned about brake energy issues on this airplane because it had small wheels and small brakes and was a fast airplane.

Mr. Sciabarra stated that he had not heard of any problems or issues with engine controls but he said he had heard of issues with the white computer lights. He stated that the engines had been very reliable.

He said that the FADEC white light was a low level light and one of the possible problems was due to moisture in the wiring. He said it was not a big issue because it did not affect the engine operation as it was just a required maintenance report after flight.

Interview: Dick Van Embry – Lear 45 / 60 Instructor / Evaluator, Flight Safety International, Tucson AZ
Date: September 23, 2008
Location: via telephone from NTSB Command Post Columbia Airport South Carolina
Time: 1235 EDT

Present were: Dave Tew, and David Helson – National Transportation Safety Board (NTSB); Charles Perrigoue – Global Exec Aviation; Todd Clamp – Federal Aviation Administration

During the interview, Mr. Embry stated the following information:

He had been employed with Flight Safety for about 11 ½ years and prior to that he was in the Air Force for 16 years. He said he was an Evaluation Test Pilot for AWACS E-3 aircraft. He said he had about 5,000 hours total flight time, 1,700 hours of which was in the E-3. He said he acquired a type rating in the Lear 60 in March 2006 and had less that 10 hours flight time in the aircraft. He said he had not done much flying in Lear Jets.

Mr. Embry said he remembered Captain Lemmon and that he conducted her recurrent check ride in the Lear 60 on August 14, 2008. He said she was very much within standards and that the outcome of her check ride was never in doubt. He said that the check ride included an oral evaluation followed by approximately 2.5 hours in the simulator.

He said Captain Lemmon took her check ride that day; her training partner took his check ride 2 days later. He stated that prior to the check ride he gave a briefing of the flight conditions for and conduct of the check ride but that he did not brief the exact maneuvers or when they would be introduced.

He said Captain Lemmon displayed good CRM and had good command of the airplane. He said she provided a good briefing to her First Officer on what she did and did not want to hear.

Mr. Embry stated that during the check ride he gave Captain Lemmon an aborted take off scenario at Wichita (ICT) airport runway 01R. He said during the scenario he introduced a thrust reverser unlocked at 80 knots. He said Captain Lemmon's performance was good and that she stayed right down the runway.

Mr. Embry stated that he could not recall any specific debrief items after the check ride and said they must have been unremarkable. He stated that he would have to look at his notes to see if there were any debrief items. He stated that he remembered that Captain Lemmon had asked him a few questions to clarify FMS procedures.

Mr. Embry stated that he was Captain Lemmon's instructor for her initial Lear training in October 2007. He said he remembered that her performance was typical for a pilot coming from a Citation. He said the first few simulator sessions were pretty rough but she came around by the end of training.

He said some people have trouble initially with some maneuvers. Thrust reverser unlocked on takeoff was a tough maneuver.

He said that Captain Lemmon was very prepared for lessons and kept information on note cards for study and reference. He said that CRM skills were normally a work in progress. He said her basic CRM skills were good and showed good progression. He said he did not recall any particular items Captain Lemmon had trouble with and that he had written in his notes that V1 cuts, single engine work and CRM were excellent. He said she progressed rapidly. He said she just had some trouble in airplane control in the beginning. He stated that he saw that a lot in Citation pilots.

Mr. Embry said he could not think of any other pertinent items in her training. He said her demeanor on the check ride was upbeat and she had good command. He said she may have had a little check-itis but once she was in the airplane she got to business.

He said that he assumed other instructors used the same scenarios for aborted takeoffs but he had not discussed it with them.

Mr. Embry stated that he was the simulator instructor for James Bland's initial training in the Lear 60 in February 2007. He said that Mr. Bland worked for a different company then.

Mr. Embry stated that Mr. Bland was about average, a little slow reacting to abnormals and engine failures but by the end of training he was performing consistently and met standards. He said Mr. Bland did not require any additional simulator training before the check ride. He said he did not recall Mr. Bland; he was referring to his notes only.

He said that Mr. Bland received an aborted takeoff scenario during simulator sessions on day 2, 3, 4, and 6. He said the scenarios he received were an engine computer light and three thrust reverser malfunctions.

He said that Mr. Bland's CRM was good but that his CRM broke down a little initially with abnormals. He said his CRM improved with time and was good by session 6. He said that Mr. Bland's CRM issue stemmed from what he called "blocked ear syndrome which he described as focusing on the maneuvers and not really listening to the First Officer. He said Mr. Bland got better with more airplane familiarity. He said Mr. Bland's CRM skills were average when he was flying as a First Officer. He said the Captain needed to take control of CRM and that by the time Mr. Bland and the other crewmember got to session 4 or 5 that they had "gelled".

He said he never witnessed Mr. Bland taking too much control when he was the First Officer. He said Mr. Bland asked a lot of questions regarding the FMS and that he was a little rough in the start of training.

He said that during high stress conditions that Mr. Bland's CRM broke down a little more than others but the learning curve was rapid and he was able to bring his CRM skills up to par by the end of training.

He said he could not think of any other performance issues with Mr. Bland. He said that Captain Lemmon was much more polished than Mr. Bland at the same stage of training but with a little time he was able to get on step.

Mr. Embry said he thought brake energy was an issue with the Lear 60, especially after a long taxi, he said he discussed this with students in training. He said that tire pressure had always been a concern with this airplane. He said pilots needed to take the 20 minutes to make sure they are properly inflated. He said brake wear and cracking had also been an issue with this airplane.

Interview: James O. Driggers – Air Traffic Controller
Date: September 23, 2008
Location: Columbia, SC Airport
Time: 1500 EDT

Mr. Driggers was represented by Steve Till, representative for NATCA.

INTERVIEW SUMMARIES

Present were: David Tew, David Helson - National Transportation Safety Board (NTSB); Charles Perrigoue – Global Exec; on the telephone was Mike Ward, Mary Strawbridge, Dan Strawbridge, Andy Dilk, Steve Kimsey - FAA.

During the interview, Mr. Driggers stated the following information:

He had worked for the FAA since 1987 and had been an air traffic controller all of that time. He had worked in Nashville, TN for about one year, Tuscaloosa, AL for about 7 years, Myrtle Beach, SC for about 8 years, and had been in Columbia, SC since 2000.

He was on the midnight shift on the evening of the accident. He was the operational controller in charge (OCIC). He was the controller that cleared the accident airplane to land at the Columbia airport on that night. He also cleared the accident airplane to taxi to the parking ramp. He issued them their clearance for the flight to Van Nuys, CA. He did not issue them the clearance to taxi out or takeoff.

There were two controllers in the tower at the time of the accident. Mr. Driggers said he was working the radar function of the approach into Columbia.

He said he and Chris (Mr. Ropolo) were in the tower when the accident airplane taxied out and down the runway. The airplane made a 180 degree turn at the end of the runway as it went into position for takeoff. One of the pilots asked for a wind check and received wind information.

Mr. Driggers said that as the accident airplane started to roll down the runway, he was talking with the other controller. He said that when the airplane was at a position on the runway that was near where taxiway F was located, he first noticed sparks coming from the airplane. He said there were a lot of sparks when he initially saw the airplane near taxiway F and he thought the sparks were coming from the right main gear. He said the airplane was going so fast that he thought they should have been airborne. He said the airplane continued in a straight line right off the end of the runway. He did not see the nose of the airplane come up and said “at no point did I see an attempt to takeoff”. When the airplane was still on the runway, he did not see any flames on the airplane.

He did not see the engine reversers come out.

He said from near taxiway F, he did not see the airplane slow down on the runway. He said the airplane maintained speed or accelerated from near taxiway F.

When the airplane departed the runway, the sparks from it were not as “heavy”. He said he saw the airplane hit the hill and it “stopped in its tracks” and then exploded into a massive fireball. He said he could not tell if the airplane was riding on its belly as it continued moving off the runway. He said he did not see the airplane flip or spin. He said that when the airplane hit the hill, it stopped in its tracks and there was no more aircraft motion.

He said when the airplane arrived into Columbia Airport on the previous flight, the approach of the airplane was normal, the landing was "normal", the airplane landed on the normal landing spot, and the deceleration appeared to be normal..

He said the airplane turned off the runway at the end.

He said during the period of time from when the accident airplane landed until the airplane departed, there was no vehicular traffic on the runway. He said the airport performed several checks a day for debris on the runway.

He was asked if he had any idea why the airplane went in the wrong direction when they left the parking ramp and he replied "he made a wrong turn".

He said he did not recall any airplane using the runway just prior to the accident airplane departure. He recalled an airplane doing practice approaches, but said he did not think it landed, he thought it performed a missed approach.

Interview: Christopher B. Ropolo – Air Traffic Controller
Date: September 23, 2008
Location: Columbia, SC Airport
Time: 1530 EDT

Mr. Ropolo was represented by Steve Till, representative for NATCA.

Present were: David Tew, David Helson - National Transportation Safety Board (NTSB); Charles Perrigoue – Global Exec; Mike Ward, Mary Strawbridge, Dan Strawbridge, Andy Dilk, Steve Kimsey - FAA.

During the interview, Mr. Ropolo stated the following information:

He had worked for the FAA for about 18 years. He had been a controller during his entire time with the FAA. He was previously a controller for the U.S. Air force. He said he had worked at the CAE airport for about 11 and ½ years.

He went on duty at 1145 pm on the night of the accident. He was working the tower position, the clearance position and the ground control position which were all the tower functions.

He said he gave a taxi clearance to the accident airplane and also issued them a takeoff clearance. He said he did not see the airplane land when it arrived in CAE. He said that when the accident airplane departed the parking ramp, they made a wrong turn on taxiway U. Because of the construction at the airport, he said it was confusing for pilots to taxi. He said the taxi clearance directed the airplane away from the takeoff runway which went "against normal".

Mr. Ropolo said that he initially thought they were on the closed runway. To save the crew time, he cleared the airplane to back taxi down the runway. The airplane was taxied at a "normal" taxi speed. When it reached the end of the runway, the airplane turned around into position for takeoff. He said it looked to him that the accident airplane used the full length of the runway for takeoff. Mr. Ropolo said he provided the crew with wind information.

When the airplane began its takeoff roll, Mr. Ropolo said he turned towards the other controller. He heard the other controller James (Mr. Driggers) say "sparks". They had both seen sparks coming from the airplane at about the same time. He said the airplane looked "dark". He said he saw sparks but not a huge stream of sparks. He said he only saw the left side of the airplane because it was closest to the tower and the left side was where he saw the sparks.

He said the airplane did not seem to slow down as it went down the runway. It looked like it was going faster than 80 knots. He said that normally by taxiway F, they were flying. He said the airplane looked like it was going fast enough to takeoff. He did not see any flames around the airplane before it reached the end of the runway. He said he saw a little fire before the airplane went down towards the road. He said he did not see the airplane move after it hit the slope.

He said he grabbed the crash phone and said "alert 3" which meant a crash on the airport. He told aircraft rescue and fire fighting (ARFF) that the airplane was located on highway 302. He told ARFF that they might have to go off airport. He said he only remembered the ARFF trucks went down the runway.

After the accident occurred, he directed an airplane on an approach to go-around and shut down the airport.

He said he did not recall any other airplane taking off or any vehicles on the runway from the start of his shift and when the accident airplane began its takeoff roll.

Interview: Fred Calvert – Chief Inspector Air Carrier, Executive Jet Management
Date: October 1, 2008
Location: via telephone from NTSB Headquarters, Washington, DC
Time: 1405 EDT

Present were: Dave Tew, and David Helson – National Transportation Safety Board

During the interview, Mr. Calvert stated the following information:

He had worked for Executive Jet Management (EJM) for about 10 ½ years. He was a certificated Private Pilot and Mechanic.

He said EJM operated as the aircraft management division of NetJets and that they had 126 aircraft on their certificate.

He said that he did not normally interact with the pilots except for maintenance items.

He said that he did not know Mr. Bland. He said Mr. Bland had worked for EJM for "not quite two years" and that Mr. Bland was a crewmember on a Lear that was managed by EJM for Suncal Companies. He stated that he thought it was a Lear 60 but would have to check his records to verify which model Lear it was.

He stated that Mr. Bland flew with one or two other pilots on the Learjet for Suncal and that Mr. Bland left the company because Suncal sold the Lear they were operating.

He stated that EJM had a Chief Pilot, Pete Djordjevic, who was charged with oversight of the flight crews for EJM.

Interview: Anne Bland – Wife of First Officer James Bland
Date: October 3, 2008
Location: via telephone from NTSB Headquarters, Washington, DC
Time: 1100 EDT

Present were: Dave Tew, and David Helson – National Transportation Safety Board

During the interview, Mrs. Bland stated the following information:

That her husband, James Bland, usually goes to sleep about 9:00 – 9:30PM and that she believed he was in bed by 10:00 PM PDT at the latest on Tuesday September 16. She remembered that he awoke at 7:00 AM PDT on Wednesday morning to catch a flight out for his trip.

She said they regularly exchange text messages and First officer Bland sent her a text message on Wednesday to let her know that he arrived in Teterboro, NJ alright. She said they also exchanged text messages on Thursday and that she spoke to him on the phone that day. She stated that she also talked to him on Friday night just before his flight.

Mrs. Bland stated that the accident flight crew had changed hotels on Thursday because it was too noisy and hard to sleep at the hotel they stayed at on Wednesday night.

She said that First officer Bland was very healthy, had no physical problems and was not taking any medication. The last time she could remember him being sick was when he had bronchitis over Thanksgiving 2007. She said that he did not have any personal issues at home or at work, that he was happy, he liked flying the airplane, and he liked the people he worked with.

Mrs. Bland said that her husband was good with money and that they did not have any financial concerns. She said that he had a Bonanza and that he had invested in many upgrades for the airplane.

Mrs. Bland said that First Officer Bland had flown a Lear for Suncal until they sold the airplane in June. She said he had about a month off and then started working for Global Exec Aviation and another company she believed was called McGraw Group. She said that both companies were "OK" with him flying with the other. She said he had turned down some flying for Global Exec flights in order to fly for McGraw Group. She said the name of the Chief Pilot at McGraw Group was John Hardy.

Interview: Pete Djordjevic – Chief Pilot Executive Jet Management (EJM)
Date: October 3, 2008
Location: via telephone from NTSB Headquarters, Washington, DC
Time: 1145 EDT

Present were: Dave Tew, and David Helson – National Transportation Safety Board

During the interview, Mr. Djordjevic stated the following information:

He had been at Executive Jet Management (EJM) for about 24 years and had been the Chief Pilot for the last 4 years. He said EJM was part of NetJets based in Cincinnati, OH and that EJM operated an FAR part 135 on demand operation for managed airplanes. He said that EJM managed a Lear 60 for Suncal until they sold the airplane in June 2008. He said they also managed a Challenger for Suncal.

He said that Mr. Bland worked for EJM on the Suncal account for "a number of years". He said that he had never flown with him and that he had never had any issues with him, nor had he heard any complaints about his flying skills. He said that most people thought he was very good.

He said that Mr. Bland flew the Lear 60 for Suncal based in Santa Ana, CA (SNA) and that the lead Captain on the account was David Thompson.

He said that EJM managed the airplane for Suncal but the pilots were trained under EJM's training program at Flight Safety. He said he never had any problems with Mr. Bland and he had heard he was "a very competent driver". He said that First Officer Bland had left EJM because Suncal sold the Lear 60.

Mr. Djordjevic said that he had no experience in the Lear 60, that he had flown a Lear 35 many years ago.

Mr. Djordjevic stated that the hiring minimums at EJM were 2,500 hours total time for a First Officer position, and 3,500 hours total time was required to upgrade to a Captain position. He said EJM never hired straight into the captain position.

Second Interview: Charles Perrigoue – Director of Operations, Global Exec Aviation
Date: October 3, 2008
Location: via telephone from NTSB Headquarters, Washington, DC
Time: 1300 EDT

Present were: Dave Tew, and David Helson – National Transportation Safety Board

During the interview, Mr. Perrigoue stated the following information:

Flight crews received their preflight training at Flight Safety using a video computer presentation given by an instructor. He said they did not perform an actual preflight of the airplane during this training and that they had a letter from the FAA stating that this was an acceptable means of training flight crews on external preflight actions.

He said Initial Operating Experience (IOE) was not required but he did it with both of the accident pilots. It was not a company policy to perform IOE and it was not published in any manuals but the company supervised the flying of every pilot for a while. He said no one got assigned to be pilot-in-command (PIC) right away; they had to fly with someone else first. It was not necessarily a check airman they flew with, it could have been a line captain since IOE was not technically required. When they could be used as a captain depended on the type of airplane and when the crewmember was comfortable. He said there was no requirement to demonstrate a preflight to a new pilot during this time of supervised flying. He said the captain did not have to document on a form that the pilot was ready and there was no requirement to document that a crewmember was proficient in performing a preflight.

Mr. Perrigoue said an exterior preflight was required first flight of the day. The preflight duty was assigned to the Pilot-In-Command (PIC), but the PIC could delegate it to the Second-in-command. He stated that the crew normally used a check list to complete the external preflight. He did not have access to a check list for the interview call but stated that generally, one started at the cabin door and moved clockwise around the aircraft to conduct the exterior preflight. When the tires were checked, he said the procedure was to visually inspect the tire for general condition, tread depth, wear, sidewall bulges, and for any cord showing. He said a visual inspection of the wheels and tires was made from the leading edge of the wing, and the trailing edge of the wing. He said a visual inspection was also made from the end of the wing looking inward at the tires to see if they appeared to be the same size or nearly the same size. He said they should appear to be round with a contact spot on the bottom of the tire the size of which was dependent on the weight of the airplane. He said it was “fairly obvious” if the tires were very under inflated but it would have to be a significant amount of under inflation.

He said that he had never, in 11 years of flying, heard of a specific frequency of checking tire pressure. He said that there was no information in any of the pilot materials including

training, AFM, POH, or Operating Manual regarding pilots checking the tire pressure and that it was a maintenance function. He said that a pilot did not know if the tire pressure had been checked by maintenance as it was not required to be recorded in any log the pilot saw. It would be recorded in the aircraft logbook by maintenance but that was not kept on the airplane. He said that FAA regulations did not require that a history of maintenance service be kept onboard the airplane for operators of airplanes with 9 or less seats.

He said that there was a list of required future maintenance inspections from the Computerized Aircraft Maintenance Program (CAMP) system kept on the airplane which the flight crew checked to make sure they could complete a flight before any inspections were due. He said that there was no documentation on the airplane for the flight crew to see when the last inspection or maintenance service occurred. He said there was a Discrepancy Form 106 on the airplane that was used to document discrepancies and maintenance corrective actions. He said ½ of the form was used to document a discrepancy and the other half to document the corrective action and that it was kept onboard for 30 days. He said there was also a "flight Log" on the airplane that pilots used to record origin, destination, and flight times.

He stated that there were certain regular maintenance interval inspection and servicing requirements but that for companies operating airplanes with 9 or fewer seats, the regulations did not require that pilots had any record of that history

Mr. Perrigoue said he was not aware that First officer Bland had another job. He said he thought First Officer Bland had been flying in his personal Bonanza and may have done some Part 91 flying for someone else but he was required to advise the company of any other commercial flying that he was engaged in. He said First Officer Bland had not turned in his Supplemental Flight and Duty Time report that had that information on it concerning additional flying.

He said that Global Exec Aviation kept track of all flight crew time and duty electronically in a computer database that was used for determining currency. He said that Second-In-Command (SIC) were exempt from 90 day currency requirements if they had an FAR Part 135.293 ride in the last 6 months. He said FAR 61.55, 61.57, 61.58 defers to FAR 135 and provided exemption from SIC currency requirements.

Mr. Perrigoue said that the Pilot-in-Command (PIC) was assigned the responsibility to do a preflight check but that the PIC could delegate that duty to the SIC. He also stated that even if the SIC was going to fly a leg in the left seat it was rare for the PIC to delegate the preflight duty. He said that a full preflight was required prior to the first flight of the day and that on subsequent flights only some items needed to be inspected.

He stated that there was a limitation in the Aircraft Flight Manual (AFM) that required the tires be inflated to a certain pressure but he did not recall what pressure that was and said that the pilot manuals did not include any discussion on servicing or checking tire pressure, nor was there any information about that provided during training. He said he

did not remember receiving any handouts from Flight Safety during training that addressed tire pressure requirements. He said that he had checked his bag that he kept all of his training material in and had not been able to find any such handouts. He said he had requested from Flight Safety, post accident, all of the normal training materials they gave out for Lear 60 initial and recurrent training. He said the training materials he received did not contain any documents related to tire pressure checks.

He said the Chief Pilot of Global Exec Aviation was Eleazar Jimenez, who flew the Gulfstream GIII and GIV. He said the Chief Pilot was much more involved in the bigger airplanes and was responsible for flight crew records.

He said that at Global, the Chief Pilot, Director of Operations, and President did most of the hiring. He said the company had no published minimum flight time requirements for new hire pilots. He said a pilot had to be current and qualified in the airplane with some time in the type of airplane. He said they never hired anyone straight into the left seat. The amount of experience they looked for depended on the type of airplane they would fly and the type of operation rather than the amount of flight time experience. He said there was no required minimum flight time for upgrade to Captain, and that upgrade was based on peer review. He said this was pretty standard hiring practice at the 9 or 10 companies he had worked for and that some of them would hire straight into the left seat.

Second Interview: Wilberg Morales – Fueler, Columbia Aviation
Date: October 3, 2008
Location: via telephone from NTSB Headquarters, Washington, DC
Time: 1500 EDT

Present were: Dave Tew, and David Helson – National Transportation Safety Board

During the interview, Mr. Morales stated the following information:

He was present on the ramp when the accident aircraft taxied in on the prior flight. He said that the female pilot opened the door and came out and gave him the fuel order to top it off but he did not see her walk around the airplane. He said the limousine pulled up with the passengers and she talked to the limousine driver and starting to load the bags.

He said he went to get the fuel truck which was about “75 to 100 feet away” and when he came back he asked her to set up the fuel panel for him to start fueling. After she did that, she went back and talked with the limousine driver. He said the male pilot then came out of the airplane to get ice and that he was talking on his cellular phone at the time. He said the male pilot checked on the fuel and secured the fuel panel and was walking around talking on his phone.

He said the male pilot went inside with him for a “couple of minutes” to pay for the fuel but the female pilot stayed outside in the airplane.

He said he saw pilots "check tires and things" all the time but he did not actually see the accident pilots check the tires. He said he did not see either pilot look under the wings.

Interview: John Hardy – Chief Pilot, McGraw Group
Date: October 6, 2008
Location: via telephone from NTSB Headquarters, Washington, DC
Time: 1115 EDT

Present were: David Helson – National Transportation Safety Board

During the interview, Mr. Hardy stated the following information:

He was the Chief Pilot for the McGraw Group flying a Lear 60 airplane since December of 2006. Previously, he had been flying for Flexjet for about 9 years and also worked at Lear in the Flight Test division around 1980. He said he was the Director of Maintenance for the Lear 25 and Lear 35.

He said at McGraw they flew mostly corporate but also did some charter flying as the airplane was on a 135 certificate held by Tango Air and owned by Mr. Schubach.

He said he had known James Bland for about one and a half years but he felt like he knew him forever because he was "a great guy". He said James first asked him about working for the McGraw Group in January of 2007. They had kept in contact and when James was laid off from Suncal, he asked him to come over to do some contract work at McGraw. He then hired him full time in August 2008 as a Co- Captain. He said Global Exec Aviation had asked him to come back and cover some flying for a while because they were short handed.

He said that First Officer Bland was a real competent pilot, that he had let him fly left seat on a few of their recent trips which he normally did not let people do until they had at least 100 hours in the airplane. He said First Officer Bland "really knew the airplane, was very meticulous, and really on top of things".

Over "the last month or so", he said he flew with First Officer Bland about 30 to 40 hours in the Lear 60. That was their informal IOE. He said they did not have a published company policy on IOE but that his personal policy was to conduct IOE with every new crewmember. He especially wanted crewmembers to spend time flying out of their home base, Carlsbad, because it was a short runway at just over 4,900 feet and he knew that "the Lear could be a dangerous airplane".

Mr. Hardy said he had been flying Lears for many years and that there had been problems with the tires on the Lear airplanes. He said the Lear 60 had the same gear system as the Lear 25 and 35, which were 18,000 pound airplanes and the landing gear system was barely adequate for the Lear 60 at 23,500 pounds take off weight, especially without the drag chute used by the older models.

He said in the Lear 60, Flight Safety taught you not to abort past 80 knots unless you had an engine fire, engine failure, or directional control issue. He said he briefed, especially out of Carlsbad, that after 80 knots even on an engine fire, he would not abort unless there was an engine failure or a major directional problem. He said it would have to be something very serious to abort after 80 knots.

He said about 5 years ago, he saw a Lear 60, operated by Flexjet; blow a right outboard tire on takeoff at Dulles airport (IAD) on a 12, 000 foot runway. He said the tire blew at about 3,000 feet down the takeoff roll at about 100 knots. He said the pilot elected to abort but when he pulled the engine thrust reversers up they did not work, he had no auto spoilers, and he had no braking. He said they found out later that the tire had come apart and damaged the squat switch so it put the airplane into the air mode. He ended up blowing the other three tires and went off the end of the 12,000 foot runway. Mr. Hardy said that he was in a Challenger 604 and the Lear 60 airplane had just left in front of him. He said he saw the airplane afterwards and the tires had gone down to the rim, there was some flap damage and the tires had taken out the squat switches.

He said that Flexjet had identified a problem and he believed there was an AD issued for the brakes but he said there was still an issue with the squat switch and wiring. He said that Flexjet had tried to get Lear to put a "metal conduit or something" over the squat switch and wiring to protect it from damage, or at least to have an override so that engine thrust reversers worked in that situation. He said that at the time he was a check airman and he never saw anything come out to address this issue. He said he thought the Lear 60 was a good airplane but he would like to see these issues addressed to make it safer.

Mr. Hardy stated that Lear knew about the problem with the squat switch and the wiring. He said back in 1985 when he was flying these airplanes in cargo operations, he said the Lear airplanes were having a "rash of tire problems". He said there were at least two other airplanes he knew of that had blown tires on takeoff, and he also had one incident of blown tires that damaged the airplane severely. He said he had a blown tire at 100 knots and he elected to continue the takeoff. He said part of the tire went into the left engine. The engine was vibrating so bad he said he shut it down and came back for landing.

He said he was not aware of any documentation published by Lear that advised operators to increase inspection of the tires. He said there was nothing in writing except the preflight inspection checklist which had an item to check the tires visually for wear. He said his company did not allow tires to wear as much as was allowed, they checked tires after every landing, and replaced them regularly. The tires were 12 ply tires and were very hard to check visually for proper inflation. They also used a company produced "go, no go guide" to inspect the wear of the brakes.

He said his company's landing procedure was to use brakes lightly, to use engine thrust reversers most of the time down to 80 knots, and then to use engine thrust reverse idle deploy down to 60 knots.

Interview: Walter Hunnicutt - Director of Flight Operations, Jetride, Inc.
Date: October 7, 2008
Location: via telephone from NTSB Headquarters, Washington, DC
Time: 1310 EDT

Present were: Dave Tew, and David Helson – National Transportation Safety Board

During the interview, Mr. Hunnicutt stated the following information:

Jetride, Inc. was based in Rogers, AR but will be relocating soon to Dupage, IL. He said Jetride, Inc. was an FAR Part 135 on demand charter operation with 24 airplanes on their operating certificate. Of those 24 airplanes, he said 6 of them (Lear 31 and Lear 35 airplanes) were not being flown due to the high cost of operating them and the thin profit margin. He said Jetride, Inc. was primarily a Lear 60 operator with 10 Lear 60 airplanes on the certificate and that at one point they were operating as many as 14 Lear 60 airplanes and have been flying the Lear 60 for about 5 years.

Mr. Hunnicutt stated that he had flown Lear airplanes for many years but had not flown the Lear 60. He said he had about 6,200 hours total time and about 2,300 hours in Lear airplanes and he was responsible for oversight of the crews operating Lear 60 airplanes at Jetride, Inc.

Mr. Hunnicutt said he had wanted to talk to us regarding the accident because one of his flight crews had an "eerily similar event" during takeoff in a Lear 60 about one year ago.

He said that while the crew was accelerating on the takeoff roll about 12-15 knots before V1 (or about 90 knots), they heard a loud noise and experienced some vibration. He said the crew elected to continue the takeoff as that was their company procedure for events in the high energy regime on takeoff. He said the crew had thought they may have had a tire issue but they did not have any further abnormal indications on the flight or on landing. The crew continued their flight and after landing, during post flight inspection of the airplane they discovered that one of the tires had failed. He thought it was the inboard tire on the left side but said he would have to check the records to confirm that.

He said regarding the history of the Lear program, that the wheels and brakes on the Lear 20 series were "phenomenally effective, in fact so effective that through it's lineage they kept the same wheels and brakes" on later models. He said that the Lear 60 had the same wheels and brakes system as the smaller Lears and that he believed the wheels and brakes were "woefully inadequate" for the larger Lear 60 airplane. He said that the Lear 60 was known for having terrible stopping performance. He said that a few years earlier, Bombardier came out with an upgraded brake system but soon after it was introduced brakes started cracking.

Mr. Hunnicutt said that Jetride, Inc. participated in the Destination Airport Analysis Program (DAAP) which allowed them to use shorter runways under certain conditions, to calculate their landing distance based on 80% of the runway in use rather than the 60% used in most FAR Part 135 operations. He said that it was difficult to operate a Lear 60 into and out of airports with only 5,000 to 6,000 foot long runways. The DAAP he said, was a result of some changes made to FAR Part 135 regulations in order to "level the playing field" between fractional operators and charter operators. He cited FAR Part 135.4, "Eligible on Demand Operations" as a reference. He said the two main areas of relief this regulation gave to charter operators were weather reporting requirements and the DAAP.

He said he was not aware of any tire issues with the Lear 60 and thought that the problem his crew experienced may have been caused by FOD on the runway.

Mr. Hunnicutt said that during a preflight of the airplane, his company procedure was to check the general condition of the tires for wear and brake pad clearances. He said the brake pads should not be less than 300 thousandths of an inch and that his crews determined this on visual inspection by looking at the distance between the brake pad and frame of the brake assembly. He said a rule of thumb was if the distance was "more than the width of a Cross pen", the brake pads needed to be replaced.

He said the Airplane Flight Manual (AFM) called for checking the tire pressure before flight and that the Lear training video showed a flight crew walking around the airplane with a tire pressure gauge. He said that "in the real world", maintenance personnel were the only ones that would check the tire pressure. He stated that his company maintenance personnel did a tire pressure check about once per week and that maintenance actions were recorded in a "travel log" which stayed with the airplane.

Mr. Hunnicutt said that there was an Airworthiness Directive (AD) issued regarding the brakes that required documenting of the cycles on the brakes and inspections at certain intervals. He then asked Mr. Lance Reynolds, Manager of the Springdale, AR maintenance facility, to join the conversation to describe the requirements of the AD.

Mr. Reynolds stated that on a new brake assembly an inspection had to be accomplished after 100 cycles. He said the findings of that initial inspection determined the intervals for future inspections. He said when you got to 25 cycles left range, the tire was "on condition" and you had to inspect the brake cores for wear after every cycle. He said his company practice and he believed the general practice in the Lear 60 community, was to replace the brakes at that time as an inspection was required on every cycle. If you upgraded to the 3 rotor brake system you did not have to comply with the AD.

Mr. Reynolds said it was known in the industry that the brakes on the Lear 60 were a little under powered. He said the landing gear system on the Lear 35 and Lear 60 were very similar but there were a few stringent things to pay attention to with respect to building up the tire assembly on the Lear 60. Specifically, he said the wheel halves where the tire bead sat had to have gone through a non destructive test procedure every time and

that a history had to be kept on the bolts that held the wheel halves together. He said if there was any question about the history of the bolts they had to be sent in for a non destructive test procedure and cleared, or they had to be replaced.

Mr. Reynolds said he did not think a tire pressure check was specifically required based on flight time or calendar but was done as a part of the other scheduled maintenance checks, for example on a 300 hour inspection. He said flight crews visually inspected the tires on a preflight and if they thought there was an issue, they would call maintenance. He said that when checked, if the tires were below a certain pressure a tire change was required. He said that from a maintenance standpoint, he had noticed that they went through tires on Lear 60 airplanes more frequently than they did on the Lear 31, Lear 35, or the Falcon 50. Mr. Hunnicutt stated that on the Lear 60, there were a higher percentage of higher effort stops; that you had to get on the brakes sooner, harder, and longer because they did not have the stopping power for the larger airplane. Mr. Reynolds stated that compared to other airplanes he considered the tire condition a critical item on the Lear 60.

Mr. Hunnicutt said that he had not heard of or seen any documentation regarding Lear tire failures causing damage to other airplane components. He stated that Mr. Schaner, Director of Operations at Airnet Systems in Columbus might have a lot more information related to tire issues. He said Airnet Systems was the largest civilian operator of Lear 35 airplanes and they had worked with Lear / Bombardier on airplane studies over the years.

Mr. Hunnicutt stated that the Jetride, Inc. training program was not airplane specific with respect to abort criteria. He said the company procedure regarding abort criteria was that from 0 to 80 knots, the pilot not flying called out any abnormal conditions and the captain called for an abort for any items. From 80 knots to V1, he said they aborted for an engine fire, engine failure, engine thrust reverser deployment, or a loss of directional control. He said that at or after reaching V1, they continued and treated it as an airborne emergency. He said they used two main sources of training information on aborts; a Boeing video titled “Moment of Decision”, and the “Takeoff Safety Training Aid” downloaded from the FAA website. He specifically cited section 2.25 of the FAA document for tire issues related to aborts. He said that the main point in those training materials related to this subject was that if an airplane had suffered a tire failure or failure of the undercarriage during takeoff, the airplane had full flight capability but the stopping capability had been compromised.

He stated that in his opinion the industry had focused too much on V1 as a go / no go decision point when “V1 was an engine failure protocol”. He said that all of the physics and science behind V1 calculations were based on the assumption of an engine failure with all other airplane components still functional. He said if you had a compromised undercarriage situation, there were no numbers to advise a pilot of what the stopping distance would be.

Interview: David Thompson – Senior Pilot, Executive Jet Management, on Suncal Account
Date: October 10, 2008
Location: via telephone from NTSB Headquarters, Washington, DC
Time: 1130 EDT

Present were: Dave Tew, and David Helson – National Transportation Safety Board, Charles Perrigoue - Global Exec Aviation, and Ed Grabman – Bombardier / Learjet

During the interview, Mr. Thompson stated the following information:

He had been with Executive Jet Management (EJM) on the Suncal account for about 5 years. He said they had operated a Challenger 300 and a Lear 60 on that account and that the Lear 60 had been sold about three months prior. He said the Lear 60 was operated under management by EJM and it was used for 135 operations and some part 91 operations. He said Suncal also had a helicopter that they operated separately from the EJM certificate with their own pilots.

Mr. Thompson said he had known First Officer Bland since about October of 2006 and that First Officer Bland had been hired by EJM in about February of 2007. He said he and another pilot, John Hardy, had flown with First Officer Bland during his initial flying on this account. He said Initial Operating Experience (IOE) was not required but that it was company policy to provide it for new hires. He said the purpose of the initial flying experience was to introduce new pilots to the company procedures and that after they were comfortable with a pilot they allowed him to fly as a captain. He said their goal was to get First Officer Bland up to 100 hours so he could be used as a captain.

He said First Officer Bland was one of the better pilots, that he progressed very rapidly, had good pilot skills, and was very meticulous. He said he had flown with First Officer Bland about 40 to 50 hours on the Suncal account and that the last time he flew with him was in February or March 2008.

Mr. Thompson said Flight Safety in Tucson, AZ did the Lear training for the pilots on the Suncal account. He said he had been going to Flight Safety in Tucson for training in other airplanes since 1995 and that he thought they had the most experienced instructors for the Lear 60 program.

He said the FAA had observed some of his training events over the years but he could not recall whether the FAA had observed any of First Officer Bland's training events.

He said Flight Safety used a video to teach preflight items and that Flight Safety did not have a Lear 60 to conduct any hands on preflight training. He said occasionally they had an airplane at the maintenance facility that they could walk around but that it was not part of the regular training program. He said when he was in training he had not received any documentation from Flight Safety regarding preflight checks of the landing gear or tires

and that there were no landing gear components, tires, or brakes used in the classroom for instruction.

Mr. Thompson said he gave new pilots hands on training for preflight procedures after a pilot finished training at Flight Safety. He said he gave First Officer Bland instruction on how to conduct a preflight and that First Officer Bland was one of the most meticulous pilots in regards to the conduct of a preflight. He said a preflight was required prior to every flight and the pilots at his company were also required to do a post flight walk around. He said he believed the tires and wheels were "the most sensitive part" to check on a Lear 60 preflight. He said the pilots conducted a visual inspection of the tires and that if the tires looked low, they called maintenance. He said he was not aware of any requirement to check tire pressure on the preflight but his company maintenance personnel signed off a maintenance checklist on the first flight of the day before the airplane left the base.

He said he was not aware of any issues regarding the tires or wheels but he was aware of an Airworthiness Directive (AD) issued for the brakes. He said the wheels were very small for the Lear 60 and the tires tended to get cuts due to the heavy weight of the airplane. Mr. Thompson said when the airplane was operated at maximum weight, the brakes were just "barely adequate" to stop the airplane. He stated that the brakes "met the minimum for certification" but he said "you won't find any pilots that were happy with the brakes" on the Lear 60. He said his company had spent a lot of money on tires and brakes for the Lear 60. He said he did not recall any specific issues with the tires on Suncal's Lear 60 but he thought that Flexjet had a couple of incidences, one of which occurred in Washington, DC.

Mr. Thompson said his company used the same takeoff abort criteria as was trained at Flight Safety. He said between 0 and 80 knots a pilot aborted takeoff for any red or yellow light, between 80 knots and V1 for any engine fire, engine failure, engine thrust reverser deployment, or for direction control problems. He said there was no training for an aborted takeoff after V1. He said he was not aware of any instance when First Officer Bland had done a rejected takeoff in the Lear 60.

He said after a pilot was familiar with the airplane, that they did not use a checklist when they conducted a preflight. He said his company used the Flight Safety checklist for the Lear 60 airplane. He stated that the Flight Safety checklist was "essentially the same" as the Bombardier / Learjet checklist but was a scaled down version. He said the company used the checklist as a challenge / response checklist and that it was used for all procedures except the after takeoff check. He said the after takeoff check was done by the non flying pilot only. He said they also used a company designed checklist in part 91 operations but it was not approved for use in part 135 operations. He said he thought that most operators had their own version of the normal checklist and that the Flight Safety version was primarily kept onboard for the abnormal and emergency procedures.

He said First Officer Bland flew the Lear 60 to Dallas, TX to transfer ownership when it was sold and he left the company a few weeks after. He said he could not keep First

Officer Bland employed at Suncal because the company was fully staffed for the remaining airplane. He said EJM tried to place him in another contract but First Officer Bland did not want to move so he did not accept any other position. He said First Officer Bland flew a helicopter a few times for the owner of Suncal after he was furloughed by EJM.

Mr. Thompson said he talked to First Officer Bland several times after he left Suncal and he seemed fine and did not have any personal, medical, or financial concerns that he was aware of. He said the last time he spoke to him was a few days before the accident. He said First Officer Bland had called from Teterboro to talk with the maintenance department because the accident airplane had a bleed air problem. He said he thought First Officer Bland had called him because Suncal had some experience in this area due to previous bleed air problems on their own Lear 60 and he may have been more comfortable calling him for information. He said he did not know if the captain was also calling her own company (Global Exec Aviation) to ask about the problem.

He said most of the bleed air problems that Suncal had were associated with the indication system rather than bleed air system itself. He thought First Officer Bland had wanted to check with him to confirm he had looked at the correct issues regarding the bleed air system. Mr. Thompson said most of the issues with the indicating system were caused by the heat sensors getting too close to the heater coil. He said the sensor was a single wire similar to that used on the engine fire detect system and that it could come loose or become bent in proximity to the heater coil.

Mr. Thompson said he was not aware of anybody having a problem with an inadvertent stow of a thrust reverser and he said he did not think it was something that was included in training.

Mr. Thompson said he had seen some pictures of the airplane post accident and he could not “figure out why those reversers were not open”. He said on a heavy aircraft “you have to use them”.

Second Interview: Dick Van Embry – Lear 45 / 60 Instructor / Evaluator, Flight Safety International, Tucson AZ
Date: October 17, 2008
Location: via telephone
Time: 0920 EDT

Mr. Embry was represented by Mr. Tom Eff – Flight Safety International

Present were: Paul Misencik, and David Helson – National Transportation Safety Board (NTSB); Charles Perrigoue – Global Exec Aviation

During the interview, Mr. Embry stated the following information:

Memory items were covered in ground school and in the simulator pre brief and simulator sessions during flight crew training in accordance with the training syllabus. He said they did not cover all of the memory items but they did cover a representative range of them. He said most memory items were covered in the classroom and some were covered in practical application during simulator training and on written exams. He said there was not a requirement to cover all of them.

He said he could not recall how many memory items there were for the Lear 60 and that the memory items covered in training were determined by the training syllabus. He said on check rides, he had introduced a "representative series" of system malfunctions such as aborted takeoff or engine failure at V1 for evaluation of flight crews and that the memory items evaluated were determined by the training syllabus.

Mr. Embry stated that the Emergency Braking memory item was done in the simulator and was usually associated with a hydraulic system failure or malfunction prior to landing. He said when a hydraulic system problem occurred; the emergency braking procedure was not always needed. He stated that when the hydraulic auxiliary pump was charged, there was still some normal braking following a hydraulic system failure but that normal braking might not be sufficient and crews sometimes needed to use emergency braking to stop the airplane on landing. He said he occasionally turned off the auxiliary pump on short final so that emergency braking was required on landing.

He said he had not introduced scenarios on takeoff that required a crew to use emergency braking. He said he usually had used an engine thrust reverser problem on takeoffs. He stated that there had been instances with the Lear 60 regarding engine thrust reversers opening or closing on takeoff or landing. He said they emphasize that at about 80 knots in simulator training.

Mr. Embry stated that he had occasionally introduced an uncommanded engine thrust reverser stow during landing training especially, he said, if the student had a tendency to deploy engine thrust reversers when the nose wheel was still off the ground. He said Bombardier had pointed out that there could be directional control problems if an engine thrust reverser opened or closed with the nose wheel still in the air. He said on landing if the engine thrust reversers were deployed while the nose was left in the air there could be directional control issues as the airplane was slowed to Vmcg. He stated this as a reason for introducing the uncommanded stow on landings. He said Bombardier had come out with information regarding the nose wheel unlocking or collapsing if it struck the ground hard due to deployment of the engine thrust reverser with the nose still in the air.
He said the simulator fidelity allowed the instructor the capability to introduce an uncommanded stow of an engine thrust reverser.

He said he had usually introduced an engine thrust reverser unlocked or deployed scenario at about 80 knots on the takeoff roll. The unlock scenario caused a takeoff configuration warning while the deployed scenario introduced a direction control issue due to asymmetric thrust.

Mr. Embry stated that he had on occasion introduced an uncommanded stow after the crew had deployed the engine thrust reversers for a rejected takeoff but he said he normally used that scenario on landings.

Mr. Embry stated the Lear 60 had a history of inadvertent stowage of the engine thrust reversers and that Bombardier had come out with the procedure (Inadvertent Stow of the Thrust Reverser After Crew Commanded Deployment) to address the issue. He said the history of that occurrence was the reason he taught this procedure in ground and simulator training.

He said this particular procedure was not specifically listed in the training syllabus and there was "no concrete assurance" that it would be covered in training. He said he was not confident that flight crew members had known about the history of this occurrence before they came to training but that he had always introduced it in simulator training. He said there was an Expanded Instructor Guidance (EIG) manual for instructors but he was not sure if this specific item was covered in that manual.

Mr. Embry stated that for preflight training, the instructors had taken crew members to the adjacent service center for hands on preflight walk around training. He said if an airplane was not available, the instructors used a computer program and classroom training. He estimated that "99%" of the flight crews had an opportunity to do a walk around of an actual airplane prior to their check ride and that one of Flight Safety's Part 135 clients required it. He said he had conducted preflight walk around training with the accident crew using an actual airplane.

He said as part of the preflight walk around training, he had focused on tire pressure checks and he had demonstrated to students that if one tire was at zero pressure, it was not noticeable next to the other tire that was properly inflated.

Second Interview: Joseph Peter Sciabarra – Lear 60 Ground / Simulator Instructor and TCE, Flight Safety International, Tucson AZ
Date: October 17, 2008
Location: via telephone
Time: 0945 EDT

Mr. Sciabarra was represented by Mr. Tom Eff – Flight Safety International

Present were: Paul Misencik, and David Helson – National Transportation Safety Board (NTSB); Charles Perrigoue – Global Exec Aviation

During the interview, Mr. Sciabarra stated the following information:

Memory items were covered in the classroom during training. He said as each airplane system was covered the students looked at the written memory items related to that system and discussed the items. He said there was not enough time to cover all memory

items in the simulator but the instructors covered about three quarters of the memory items in the simulator and covered the rest during simulator session pre briefs.

Mr. Sciabarra estimated there were about 12 to 15 memory items for the Lear 60 airplane and he was not aware of a requirement that all of them had to be covered during training. He said the crews were required to cover all of the steps in a memory item and in a safe manner to be considered successful. He said the instructors determined which specific memory items they covered during training such as engine failure, V1 cuts, fires, and flight control issues. He said as an example that the Auto Start memory item is one that the instructors tended not to cover because it was time consuming and the airplane systems usually initiated an auto start cycle without pilot action.

He said "emergency braking was not a memory item" and that it was usually a part of the aborted takeoff checklist. He stated that emergency braking was covered in the classroom and in the simulator during training on hydraulic system malfunctions. He said normally the emergency braking training was covered during landing events but that occasionally there was an emergency braking scenario introduced during takeoff.

After referring to the flight manual, he said emergency braking is a memory item but that it just told a pilot to move the handle and the instructors covered the actual use of it during ground school and briefings.

Mr. Sciabarra said he had occasionally set up an aborted takeoff scenario in the simulator using a tire failure or squat switch failure event. He said he had not used an inadvertent engine thrust reverser stow event for takeoff training but he had used it for landing training.

Mr. Sciabarra said the simulator had a selection to introduce an inadvertent stow during a landing. He said he occasionally had introduced a blown tire or hydraulic failure during takeoff which prevented the engine thrust reversers from being deployed. He stated that if a squat switched failed, the engine thrust reversers would stow and that the simulator had a selection that allowed the instructor to fail a squat switch, fail hydraulics, or to stow an engine thrust reverser.

He said the Lear 60, and he thought other Lear models as well, had a history of uncommanded stow of the engine thrust reverser(s) on landings. He said the problem was related to the air ground switches "breaking contact" and the airplane thought it was in the air mode which caused one or both engine thrust reversers to stow. He said if the engines were at high power during reverse thrust and the engine thrust reversers subsequently stowed, that the engines were still at a high power setting.

He said the airplane manufacturer had changed the procedure (Inadvertent Stow of the Thrust Reverser After Crew Commanded Deployment) from an abnormal procedure to a memory item emergency procedure a "number of years ago". He said they covered this in ground school and in the simulator during landing events but not during takeoff events.

He recalled an incident in a Lear 60 “a long time ago” that occurred on takeoff and he thought it might have occurred at Dulles airport. He said he was fairly confident that crews were aware of the possibility of a squat switch failure or an inadvertent stow of the engine thrust reversers and that the airplane manufacturer had issued a bulletin “years ago”. He said Flight Safety instructors covered that in training. He said he did not recall the exact sequence of events but he thought the Lear 60 was not the first Lear airplane to have had this problem and he said there were “a number of Lears that had a squat switch go into the air mode”.

He said he could not recall if an uncommanded engine thrust reverser stow was specifically addressed in the training manuals. He said it was a subject they knew about and covered during training.

Mr. Sciabarra stated that he was fairly confident that flight crews knew that an uncommanded stow of the engine thrust reversers could have resulted in forward thrust and that Flight Safety covered this topic for that reason. He said that was also why Bombardier changed the procedure (Inadvertent Stow of the Thrust Reverser After Crew Commanded Deployment) to a memory item.

He said he was not aware of specifically where to find a list of Lear 60 airplane incidents and accidents but thought that it could be found on the internet. He said there was not a training module that specifically addressed previous accidents and incidents but that the classroom discussions held by the instructors were based on bulletins they received from the manufacturer.

Mr. Sciabarra said that occasionally he had introduced an inadvertent stow of the engine thrust reversers following a deployment on a rejected takeoff but that he did not do that scenario for every crew he trained. He said he had introduced a failure of the engine thrust reversers to deploy on an aborted takeoff scenario.

He then referenced the training manual module 5 which addressed engine thrust reverser malfunction and stated that most of the time the instructors introduced an engine thrust reverser deploy on takeoff to trigger an abort rather than introducing an uncommanded stow after the engine thrust reversers were deployed.

He said there were lights in the Lear 60 related to engine thrust reversers to show whether they were unlocked or deployed; green thrust reverser armed lights, amber thrust reverser unlocked lights, and white thrust reverser deployed lights. When the engine thrust reversers were deployed the lights sequence from armed, to unlocked, to deployed. He said that following a thrust reverser deployment, if the engine thrust reversers stowed, the white lights would have gone out and a crew would have noticed acceleration.

In regards to directional control issues caused by asymmetric engine thrust associated with engine thrust reverser deployment, he stated that “directional control means left and right”.

Mr. Sciabarra stated that he had always trained crews in initial and recurrent ground school regarding underinflated tires and that some years ago he started to provide a handout to crews on the topic of underinflated tires. He said he also included an excerpt from the maintenance manual regarding tire pressures and tire servicing. He said he was confident the other instructors at Flight Safety had also covered this area in training and said they also used his handouts. He said he could not train pilots on how to determine if the tires were properly inflated but he emphasized in the classroom and the briefings that it was "worth the extra 20 minutes to do the tire pressure checks correctly" and to have them serviced if needed. He said it was difficult to determine proper tire inflation from a visual inspection. He said he did not know what constituted "critical under inflation" of the tires and that he had "no idea" what critically under inflated tires looked like. He said that there was no way to know if the tires were inflated properly unless they were checked.

Interview: Andrew Moretti – Pilot, Global Exec Aviation
Date: October 22, 2008
Location: via telephone
Time: 1230 EDT

Present were: Dave Tew, and David Helson – National Transportation Safety Board (NTSB); Ed Grabman – Bombardier Learjet; Charles Perrigoue – Global Exec Aviation

During the interview, Mr. Moretti stated the following information:

He had worked for Global Exec Aviation for about 3 years flying the Gulfstream GIII and Citation VII (CE-650) and had no financial interest in the company. He said a type rating in the Citation VII permitted a pilot to also fly the Citation III, and Citation VI. He usually flew as second in command (SIC) and had accumulated about 2,400 hours total time, and 600 hours of jet time, the majority of which was in the GIII.

His initial training at Global Exec Aviation consisted of a 4 day initial indoctrination training ground school, and airplane ground school and simulator training at Flight Safety and Simuflite. He said he thought the training he received at Flight Safety in Long Beach, California was "very good". He had never flown the Lear 60 airplane.

He said the criteria used to determine when an aborted takeoff was necessary were basically the same for all the airplanes at Global Exec except that the airspeed used to determine where the high speed regime began was different. He said the criteria were listed in the Flight Safety manual Standard Operating Procedures (SOP) section. In the GIII, below 90 knots an abort was called for any lights or abnormal conditions such as vibrations, from 90 knots to V1 an abort was called for engine failure, engine fire, loss of directional control, or an engine thrust reverser deployment. After V1, a pilot continued the takeoff and handled the problem in the air.

Mr. Moretti said the training he received for preflight walk around procedure was presented in a computer video that described each item to be checked and provided photos of various items in the correct and incorrect configuration. He said during training he used a written checklist to follow through the preflight video. He said there was no preflight training on an actual airplane at Flight Safety.

After his ground school and simulator training he performed hands on preflight training on an airplane at Global Exec with an "experienced pilot". He said the preflight procedure required a visual inspection of landing gear, wheels, and tires and if something did not look right, maintenance was called. He said pilots did not check tire pressure, that checking tire pressure was a maintenance function.

He said because the GIII was an airplane with more than 9 seats, a flight log was required to be kept on board the airplane and maintenance was required to document a preflight inspection on a space provided on the log. He said there was also a Discrepancy Log to document discrepancies and corrective actions by maintenance. He said the pilots were responsible for calling the Director of Maintenance to document any discrepancies and when away from base, the Director of Maintenance coordinated with contract maintenance on corrective actions.

Mr. Moretti stated that he had never met First Officer James Bland but he knew Captain Sarah Lemmon and had flown with her in the Citation VII. He said Captain Silvestri and Captain Lemmon were the primary pilots on the Citation VII at Global Exec and he filled in for one of them occasionally. He estimated that he flew as SIC with Captain Lemmon one or two times per month in the Citation VII since January of 2008 with the last time being early August 2008.

He said he enjoyed flying with Captain Lemmon because she was a "good pilot", she had good hand eye coordination, had good communication and CRM skills, good situational awareness, and she knew the airplane systems and limitations well. He said she was the type of person that would not rest until she found the answer to a question or issue. He said she was very friendly and always easy to talk to. He was not aware of any medical, financial, or personal issues regarding Captain Lemmon. He stated that she wore contact lenses.

Mr. Moretti said the flights he did with Captain Lemmon always went "pretty smoothly", that she always asked for checklists when required. He could not recall any abnormal or emergency events while he was flying with her and he said he never had an aborted takeoff while flying with her. He had not attended any training or check ride events with her.

He said he typically did the preflight when he flew with Captain Lemmon but she was always at the airplane ahead of him and had already done a preflight. He said she appreciated him doing the preflight as well because she had a "good outlook on safety". He had seen her perform a preflight before and said he thought she was "thorough" and did as good a job pre-flighting as anyone else he flew with.

Mr. Moretti said Captain Lemmon gave a typical before takeoff brief which included a discussion of the departure clearance, V speeds, abort criteria, and any thing that was a factor on the takeoff such as weather, a wet, or short runway.

He said in the Citation VII, they used the same abort criteria as in the Gulfstream except that they aborted for anything below 80 knots instead of 90 knots.

He said during simulator training he had done several different aborted takeoff scenarios. Some were before 80 knots and some were after 80 knots. He said in training that he sometimes had to abort for items that were not specifically covered in the brief for example a "nose wheel steering hard over". He said the airplane turned sharply and that caused a loss of control situation.

Mr. Moretti defined a loss of directional control as loss of control in either a lateral or vertical direction or an uncontrollable acceleration or deceleration. As an example he said if you tried to rotate the nose and it did not rotate, that was a loss of directional control.

Interview: Federico Silvestri – Pilot, Global Exec Aviation
Date: October 22, 2008
Location: via telephone
Time: 1315 EDT

Present were: Dave Tew, and David Helson – National Transportation Safety Board (NTSB); Ed Grabman – Bombardier Learjet; Charles Perrigoue – Global Exec Aviation

During the interview, Mr. Silvestri stated the following information:

He had worked for Global Exec Aviation for about 4 ½ to 5 years. He was a copilot on the Gulfstream GIV and a Captain on the Citation VII (CE-650). He had about 3,700 hours total time, about 2,300 hours was obtained while working for Global Exec. He said he had previously been a co-pilot on the Lear 35, Gulfstream GII, GIII and the GIV. He did not have any financial interest in the company.

He said he had flown the Lear 60 on one or two short flights but had not been to training yet.

He was type rated in each of the airplanes he had flown at Global Exec and had done all of his simulator training at either Flight Safety or Simuflite. He said he had high respect for Flight Safety because the training was really good there and it was one of his favorite places to go for training.

Captain Silvestri could not recall any FAA inspectors observing his training or check rides while he worked at Global Exec except for one line check in the Citation VII he did with Captain Lemmon. He said there were two FAA inspectors observing that flight.

He said 90% of his preflight training was by video at Flight Safety and the other 10% included the use of a written checklist while following along with the training video. He said he performed a walk around of an airplane at the Wichita Service Center while training on the Citation VII. He said he had never been to training at the Flight Safety facility in Tucson, AZ.

Captain Silvestri said after training was completed he performed preflight training on an airplane at Global Exec with an "experienced captain". He said during the preflight procedure, the pilots performed a visual inspection of the landing gear structure, the shocks, and tires to check general condition, tire tread wear, and tire inflation. He said he had never been trained to check tire pressure, had never checked tire pressure and had not known of any pilots that had checked tire pressures. He said a mechanic checks tire pressure and signed off the check in an airplane log that was carried on the airplanes with more than 10 passenger seats.

He said the Flight Safety training for aborted takeoffs was fairly standard and that he used Flight Safety abort criteria. He said that a typical pre takeoff brief used different terminology and speeds for different airplanes but included a discussion of standard calls, checklist items, and the use of the speed brake. He said that prior to 80 knots you aborted for any lights or malfunctions, between 80 knots and V1 you aborted for an engine failure, an engine fire, a loss of directional control, a catastrophic failure, or an engine thrust reverser deployment. He said either pilot could call for an abort.

He said it could be slightly confusing flying different airplane types but if you were only flying two different types it was "fairly easy" to keep the procedures straight.

Captain Silvestri said he never flew with First Officer James Bland but he knew Captain Lemmon and had flown with her in the Citation VII. He said he went through Citation VII training at Simuflite in Wichita with Captain Lemmon in January of 2008 and had flown with her about 150 hours on the airplane since that time.

He said they were both Captains on the Citation VII; they rotated the Pilot in Command (PIC) duty on each trip and swapped seats after every flight. The flying pilot always sat in the left seat.

He said the training event with Captain Lemmon went "fairly well" and he thought the instructors were happy with their performance. He did not recall any specific problems or issues either of them had in training.

Captain Silvestri said he enjoyed flying with Captain Lemmon because she was a good friend and a good pilot. He said she was not weak or bossy as a captain, had "great CRM" skills, a lot of experience and he never had any problems flying with her. He said she was "a little green" but was more than qualified as a captain.

He did not recall ever having an abnormal or emergency situation while flying with Captain Lemmon and he last flew with her in early September 2008 on a flight up to Napa, California.

He said he was not aware of personal, financial, or medical problems with Captain Lemmon. He thought she was very happy as she had just moved in to a new house recently.

He said he was the SIC on a line check with Captain Lemmon and two FAA observers in the spring of 2008. He said the line check went well and he recalled that at one point she had gone through an altitude slightly but not enough to cause Air Traffic Control or the two FAA observers to comment about it.

Captain Silvestri said Captain Lemmon's initial check ride in the Citation VII simulator went very well. He could not recall how many aborted takeoffs they performed during training but said they had different scenarios including engine failures, engine fires, engine thrust reverser deployments and possibly some fuel warning lights for a low speed abort.

He said he could not recall ever performing an abort in the airplane with Captain Lemmon. He said he had to perform a low speed abort a long time ago at John Wayne airport in a Gulfstream GII for an abnormal light.

He said nobody had ever defined for him what was meant by "loss of directional control" and he considered it to be anytime the airplane was not controllable or had an uncommanded full deflection of a flight control surface.

Captain Silvestri said he had never performed any abort training for any items besides the ones which were normally briefed. He said during his GII training at the Long Beach, CA Flight Safety training center the instructor demonstrated that if an engine failure occurred at V1 on a contaminated runway, the airplane did not have enough power to accelerate to take off speed.

He said when he flew with Captain Lemmon they agreed before each flight which one of them would conduct the preflight inspection. He saw her conduct a preflight and said she was "very thorough" and used the check list the way they were trained.

Interview: Carl Lapiska – Manager of Engineering, Dallas and Montreal, Bombardier Training Centers
Date: November 13, 2008
Location: via telephone
Time: 1400 EST

Present were: Dave Tew, and David Helson – National Transportation Safety Board (NTSB).

Mr. Lapiska was assisted by Mr. Derrick Glover, Chief of Engineering.

During the interview, Mr. Lapiska stated the following information:

He was the Manager of Engineering for the Bombardier training centers in Dallas and Montreal and the site Manager for the Dallas training facility.

The Dallas facility had one full time Lear 60 simulator and one simulator that was convertible between the Lear 60 and the Lear 60XR model airplane. The Lear 60XR had Collins Proline avionics and the conversion was accomplished by changing screens and avionics components depending on what type airplane was needed for the simulation.

The simulators were built by CAE and had been online since 2006. Both simulators were approved level "D" simulators by the National Simulation Program Team.

The simulators were primarily used for training company pilots and for customers who purchased company airplanes. The Bombardier training program was approximately two week course, half of which was ground school training and the other half was simulator training and check rides. Bombardier also offered a recurrent training program that was either two or three days depending on the customers needs. The simulators were also used to provide maintenance training in engine starts and taxi procedures.

Mr. Lapiska stated that he was not sure how many malfunction scenarios were programmed into the simulator and he was not sure if they represented 100 percent of the malfunctions included in the Pilot's Quick Reference Handbook (QRH). Mr. Glover stated that he thought there were between 250 and 275 programmable malfunctions in the Lear 60 simulator.

Mr. Lapiska said there were basically two types of simulator hardware; one of which utilized simulated components on the flight deck to replicate the airplane being simulated, and the other, which was used by Bombardier, used actual airplane avionics components on the flight deck and those components were "stimulated" by the computer model to replicate the airplane functions. The software is derived from data obtained through airplane testing and aerodynamic modeling. He said engine sounds are derived from recordings of actual airplane operations.

Mr. Lapiska said there were a number of possibilities for introducing brake malfunctions most of which were related to loss of braking but he thought there was also the ability to lock a brake and overheat it.

Mr. Lapiska said the simulator could be programmed for one or multiple burst tires. He said there is no flight test data collected for burst tire events so the data used to simulate burst tires was modeled by engineers to represent the drag on the airplane and flight test pilots helped tune the motion cues.

He said when there was a single burst tire; there was a faint aural cue that could be missed if one was not listening for it. There was also a small change in roll angle associated with the burst tire that he said was "almost unnoticeable". He said when both tires on one side were burst at the same time there was a faint aural cue but a more dramatic motion cue in the form of a small role toward that side and a dramatic vibration that occurred throughout the cockpit that is represented by the loss of rolling friction on that side. There would be an intermittent friction that caused the vibration. He said there was no objective data to show that was actually what would happen in the airplane, the data was obtained from subjective analysis by the engineers familiar with ground control dynamics and test pilots that may have had some experience with that type of event.

Mr. Lapiska said a single tire burst would be almost imperceptible but a dual tire burst on one side would be "quite noticeable". He said the simulator could be programmed to burst the tires sequentially or simultaneously. He said there were some inherent simulations that will result in burst tires for example; excessive brake use will cause overheated brakes and tires and could result in a burst tire.

He said he did not think the simulator could simulate under inflation of the tires, the tires would have to be burst to simulate loss of pressure in the tires.

Mr. Lapiska said he did not know if the simulator could create an inadvertent stow of a thrust reverser scenario.

Mr. Lapiska said the simulator was capable of producing some gear system failures such as collapsed gear and failure to extend.

Mr. Glover said he thought there were malfunctions associated with the squat switches but was not sure how they were represented.

Interview: Michael L. Chittick – Fleet Training Program Manager, Flight Safety CMU, Federal Aviation Administration
Date: December 16, 2008
Location: via telephone
Time: 1000 EST

Present were: Dave Tew, and David Helson – National Transportation Safety Board (NTSB); Bob Drake and Victoria Anderson – Federal Aviation Administration

During the interview, Mr. Chittick stated the following information:

He had worked for the Federal Aviation Administration (FAA) for about 7 years. During that time, he was a General Aviation (GA) operations inspector at the Scottsdale Flight Standards District Office (FSDO) for about 6 years until he became a Fleet Training Program Manager for the Flight Safety Certificate Management Unit (CMU). Prior to

being hired at the FAA, he was a Designated Pilot Examiner in the Phoenix area for about 11 1/2 years.

Mr. Chittick described his Fleet Training Program Manager duties as having oversight of Flight Safety International training for the Lear 60 and Challenger airplanes. He was type rated in both airplanes by the FAA.

He had heard of Global Exec Aviation (GEA) but had not had any interaction with them.

He had done some surveillance of Training Center Evaluators (TCE), personnel, and record checks as well as surveillance in ground schools and flight simulators.

He said he did not have oversight of specific FAR part 135 operators' training programs; those programs were approved by the Principle Operations Inspectors (POI) of the operators. He said occasionally an operators POI would call and ask him to do surveillance of a TCE in order to approve that person for the operators' training program. He did not recall ever receiving such a request from the POI of Global Exec Aviation.

Mr. Chittick stated that he primarily worked with the part 142 training program. He said he did not provide any approval of a 135 operators training program, he only provided some surveillance of a company check airman doing part 135 check rides in order to sign the check airman off.

He said he did not look over a 135 operators training program but would make sure the check airman was familiar with certain items in the training program. He said he would also look at the pilot training folder and quiz the check airman about any particular items that he should be aware of. He summarized by saying that the purpose of his surveillance of a check airman was to make sure the check airman was doing his job satisfactorily, not necessarily to evaluate the operators training program or if the crew was receiving the proper training within that program. He stated that it was the operators POI who was responsible for evaluating the training program.

He stated that he was not familiar with the Bombardier Learjet 60 training program, as he had done his training at Flight Safety.

Mr. Chittick said that when he was observing Flight Safety training program, he usually sat through a sampling of the training modules with different crews and he had not observed an entire training program with one crew.

He stated that he had observed aborted takeoffs in training.

Mr. Chittick said he had been through the flight simulator training but had not flown the Lear 60. He said he normally did his required Lear 60 flight simulator training quarterly and each time he received about 3-4 hours.

He said he was familiar with the "inadvertent stow of a thrust reverser" checklist. He said when he went through training in November 2007 it was covered in ground school. He could not recall exactly what was said in training on this topic but he remembered they had gone through the Bombardier checklist procedure for an inadvertent stow of a thrust reverser during training.

He stated that he had received an inadvertent deployment of the engine thrust reverser during flight simulator training both before V_1 and after V_1 but he could not recall if he had received the inadvertent stow of an engine thrust reverser in the flight simulator training. He stated that he thought he had seen that scenario when he was observing flight simulator training but he was not sure.

Mr. Chittick said he was located at the Phoenix office and was the only one in that office with the oversight of Flight Safety Lear 60 program. He stated that he probably went to Flight Safety in Tucson, AZ 2-3 times per week on average he said, probable two times per week and was there mostly watching checking and testing events rather than training events.

He stated that the Flight Safety CMU was relatively new. His work program was set up by the Flight Safety CMU. He was not in the same location as the CMU but interacted with them at least once each day.

He said he did not interact much with the POI's of 135 operators unless they called him to request an observation of an event. He said he thought after the new 8900 rules, written by the FAA, he expected to interact with them more in the future.

Mr. Chittick said he did not recall having any interaction with the POI of Global Exec Aviation regarding the Flight Safety training program. When asked if he had ever seen any POI's of other 135 companies come to Flight Safety to observe training he stated that "he had never seen that…yet."

He stated that he was not responsible for watching the training of 135 operators' crew training. He said he would not observe a 135 operators' crew training unless the POI of that operator called him and specifically asked him to do so. He stated that he had not had any requests from POI's to do that type of observation.

He said normally, in the course of his duties, he only looked at a crewmember's personnel and training records to make sure the TCE he was observing was covering the correct areas. He would quiz the TCE to make sure the TCE knew how to determine the correct areas were being covered for a particular crew based on that crews' training program.

When asked if there were any areas of concern in the Lear 60 training program he said keeping a close eye on the ground and simulator training and the checking and testing were always important. He said since the accident, he was a little concerned about air

pressure in tires. He said there were a few areas people need to be aware of on the Lear 60.

Mr. Chittick said Flight Safety used computer based training to train crews on preflight items. He said he could not recall anything in the preflight requiring a tire pressure check. He said the preflight included a visual inspection of the tires condition "for tread, damage, etc…" He stated that you could not determine visually that the tires were under inflated. He said since this accident, Lear 60 operators have been concerned about the tires. He said he has asked some part 91 and part 135 operators about the procedures they use to check tire pressure and he did not receive "any good positive comments on how they do that."

He said he did not get to fly the airplane so he did not have experience with how the tire checks are accomplished in flight operations. Regarding the landing gear and tires, he said flying the Lear 60 was like "flying an elephant on roller skates."

Mr. Chittick stated that with the speed and quickness of the Lear 60 on takeoff and landing, he thought there should be some procedure put in place so pilots know what the tire pressure was. He said there was not a procedure that he knew of that accomplished this.

He said there was another Lear 60 Fleet Training Program Manager, based in Atlanta, overseeing Flight Safety who occasionally did some surveillance of the Tucson facility but that he was the one who primarily did that.

He said he was responsible for oversight of Flight Safety 142 training program and that his surveillance was mainly to ensure that they were following the Lear 60 training curriculum, using correct procedures, and covering the proper amount of ground hours and materials in ground school. He said since he had only been in this position for about a year, he had not had the time yet to sit through an entire training program at one time, but he thought he would be able to this year.

Mr. Chittick stated that he had completed all of the required items in the work program last year but could not recall how many planned items he had. He said he completed a PTRS report on each event. The PTRS reports were not sent to a specific operator but he said if he noticed a particular problem while observing a crew in training, he would notify that POI if he knew which operator and POI had oversight of the crew involved.

He said he looked at the SAFO's that came out to see if they applied to the program he was overseeing. He did not recall any unsatisfactory events in the Lear 60 at Flight Safety and stated that the TCE's for the Lear 60 program there were "very professional, sharp people." He said since he has been in this position, he had not had any comments to Flight Safety requiring them to make changes to their program. He had not received any comments from operators or crews regarding the training program.

He said when he completed his training on the Lear 60 he felt comfortable with the training provided for an inadvertent engine thrust reverser stow. He said according to what he could recall, the training for an inadvertent stow of an engine thrust reverser was covered adequately.

He said when he did his FAA 4040 training requirement he did approaches, emergencies, and abnormals but could not recall the exact items covered as it was real busy. He said he always had a flight simulator operator and a qualified co-pilot in the other seat when he did his 4040 training. He would advise the simulator operator of what items he needed to cover and if there was time they would cover additional items. He stated that he had been given an engine thrust reverser stowage on takeoff during this training.

Mr. Chittick said he thought if there was an inadvertent stowage of an engine thrust reverser on takeoff that there would be a flashing green light indicating the FADEC and engine thrust were trying to "do its thing" and trying to stow the reverser. He said he did not think you would see an amber TR UNLOCK light or a white TR DEPLOY light. He said the thrust would depend on what the squat switches were doing, and he thought that if you started to bring the reversers in the bulk pin would prevent you from pulling the thrust reverser levers up. He said you would notice a yaw if one side was deployed while the other stowed.

If you were already in full reverse, he said he thought both amber and white lights would go out but you would see a master caution. He believed you would still have thrust but if the engine reverser doors were closed it would switch to forward thrust. He said if this occurred on both engines after full reverse was selected, it would "have a tendency to slingshot you down the runway". He said he had an engine thrust reverser inadvertent stow on one engine in flight simulator training. He did not recall having an engine thrust reverser inadvertent stow on both engines in training, nor did he recall ever observing one in his surveillance.

Mr. Chittick said the abort criteria trained at Flight Safety was to call out anything prior to V_1 and in the event of an abort deploy the drag chute. This was covered in a Lear procedures supplement and covered the whole Lear series; he said the Lear 60 did not have a drag chute. He stated that Flight Safety trained crews to abort for any abnormal or emergency before V_1. He said the pre takeoff briefing was a general statement and covered an abort for any abnormal before reaching V_1 for example he said if there was an engine failure before V_1 you would abort. He said there were also things other than an engine failure that you would abort for, but you would not abort for anything after V_1 in this airplane.

He said the Flight Safety part 91 and part 142 training called for aborting a takeoff for any problem before V_1. He said some operators would abort for anything before 80 knots and then only abort for major items from 80 knots up to V1 such as an engine fire or engine failure. He said at Flight Safety the procedure was to abort for any problem before V_1, but he had heard some operators cover the 80 knot callout in their pre-takeoff briefing.

He said the abort criteria were covered in ground school and in "book 2" (Flight Safety Pilot Training Manual volume 2) under briefing guides and the instructors at Flight Safety taught that you did not abort for anything above V_1. He said for an engine failure above V_1 you would normally continue the takeoff. He thought abort criteria were covered in the Lear Procedures supplement that Flight Safety handed out in training.

Mr. Chittick said he had a tire blowout in training at about 90 knots. He said in that situation, he had chosen to continue the takeoff and then came back around for landing. He said the instructor was happy with his decision. He said he did not recall anything in writing about aborting for blown tires.

He said he did not recall seeing a video regarding abort procedures in ground school.

In regards to this accident; he said after V_1 is called a pilot takes his hand off of the throttles and places it on the yoke, the airplane accelerates very quickly and he wondered why a pilot would abort after that point.

Interview: Joseph D. Schnieders – Learjet 60 captain
Date: January 12, 2009
Location: via telephone
Time: 1300 EST

Present were: David Helson and Katherine Wilson– National Transportation Safety Board (NTSB);

During the interview, Mr. Schnieders stated the following information:

He was employed as captain with a company in San Antonio, TX, flying the Challenger 300 and the Citation Excel. He had been at that company for about five years and had about 6,800 hours total time, 6,300 of which were logged in a jet airplane.

Mr. Schnieders said he called to discuss with us an event that occurred in a Lear 60 in June of 1998. He said at the time, he was employed as a captain on the LR-60 at Bombardier Flexjet and had been at that company for about two years when the event occurred. At Bombardier Flexjet, he had flown a Lear 31 for about one year and then transferred to the Lear 60 in July 1997. At the time of the incident, he had logged about 3500 hours total time and about 500-600 hours in the Lear 60.

On the day of the incident, he and Scott Fesler had picked up the airplane in Dallas, TX, out of maintenance where it had four new main gear tires installed. He said they flew to Chicago and then to Dulles International Airport (IAD), Dulles, VA, to pick up six passengers for a flight to Saint Thomas. The flights from Dallas to Chicago and from Chicago to IAD were uneventful and there were no squawks on the airplane.

In IAD, they fueled the airplane and loaded the passengers and bags. He said the airplane was loaded to near maximum takeoff weight. They taxied the airplane from Hawthorne Aviation (now called Landmark Aviation) down to runway 1L (which was now 1C). He said it was a long taxi from the north end of the airport to the south end of the airport for departure.

He said he did not recall the temperature but that it was early or mid afternoon in Virginia so he estimated it was in the mid to high 80's. He said he was in the right seat and Scott (Mr. Fesler) was the pilot flying in the left seat.

Mr. Schnieders said they were cleared for takeoff and started to roll down the runway. He did not recall exactly what speed but thought at about 100 knots, he heard a "loud bang". He said it sounded like a blown tire and that he was "pretty certain" it was a blown tire because he had experienced one before in another airplane. He said it was fairly early in the takeoff roll and they had not used a lot of runway. He said he called for an abort.

He said at about the same time, Scott called abort and executed the abort procedures. He said Scott applied brakes and engine thrust reversers and he could hear pieces of tire and debris hitting the airplane.

He said the airplane was not slowing down. He said the brakes were not working and the engine thrust reversers did not seem to be working. He said that, at that time, he mentioned to Scott (Mr. Fesler) that maybe they should shut the engines down because he thought they might be adding to the situation with the reversers being stowed. He said because of the logic with the FADEC they might be adding to the thrust by having the thrust reverser levers deployed. He said the reversers were stowed and so they tried the emergency brakes but they were not working either. He knew they were not going to stop. He said the emergency brake might have been working a little on the left side because the airplane was pulling to the left a little.

Mr. Schnieders said they were approaching the end of the runway and still going about 30-40 knots and they went off the left side of the runway before the end. He said the airplane stopped relatively quickly. He said after the tire blew they did not know what the situation was so after they came to a stop, he got out and took care of getting the passengers out of the airplane while Scott handled the cockpit procedures. He said there was no fire and they secured the airplane and waited for the emergency vehicles to show up.

He said afterwards he found out that both right side tires had blown and the wheels had come apart. He said parts of the wheels or tires had gone through the flap and had taken out the squat switch. He said after seeing that, it made sense as to why the thrust reversers did not work. He stated that he thought part of the FADEC logic was that if you did not have weight on wheels, the engine thrust reversers would not deploy and you would lose braking. He stated again that the normal braking did not slow the airplane

down. He said he was not familiar enough with the system to know for sure but he said that from what Scott had told him, it did not feel as though they had normal braking on the left side.

Mr. Schnieders went through the abort procedure and said they initially brought the thrust to idle, applied maximum braking, deployed the engine thrust reversers, and used the ground spoilers. He said after they started the abort, he could hear debris hitting the airplane and it was not slowing down like it should have been. He said they might have had a little braking before the squat switch went out.

He said they were going fast but were nowhere near V_1, which he estimated was about 130 knots. He said given the amount of runway, it was a "no brainer" to abort. He said he had been taught in training for another airplane that if you have residual thrust you can shut down the engines to take away any thrust. He said they did not do that but he thought about it and mentioned it to Scott during the abort.

He said he knows now that the logic of the system may have prevented the engine thrust reversers from deploying. He said he later learned that if you lose the input from the squat switch, the airplane thinks it is in the air mode so the system will not let you deploy the reversers. He thought maybe the thrust reversers never deployed but he was not sure. Mr. Schnieders said he spoke with a mechanic after the event and then he understood the logic of the system.

He said he thought that Bombardier Learjet had come out with a modification to the airplane that would allow the engine thrust reversers to be deployed when input to the squat switch was lost and the airplane went to air mode. He said that modification had not come out yet at the time and he did not know if it was instigated by this event or another one. He stated that he thought the Lear 60 he flew in San Antonio had the modification on it.

He thought that the engine thrust reversers did not deploy or if they did, they were only out initially and then stowed right away when the squat switch was destroyed. He said that as far as he could recall, Scott had pulled the engine thrust reverser power levers up. He said he could not recall when or if Scott had put the thrust reverser levers back down but thought they were at least at the reverse idle position during the whole event. He said he was pretty sure Scott did not take the reverser levers out of reverse to the flight idle position. He said he thought that the engines still accelerated with the reverser power levers deployed even if the reverser clamshell doors had closed but he could not recall if the engine power was increasing.

Mr. Schnieders said he received his initial Lear 60 type rating training at Flight Safety in Tucson, AZ, in July 1997. He said he thought in training they had received training on an uncommanded / inadvertent stow of an engine thrust reverser. He said in the simulator, he remembered doing an aborted takeoff and applying engine thrust reversers and only one of them deployed. He said there was some yaw but that it was a non event, directional control was not an issue. He said this scenario was not a main focus in

training but just one of many scenarios. He could not recall if he received that malfunction at low or high speed during the takeoff. He stated that he could not recall if the thrust reverser ever deployed before stowing when he received that scenario in training.

Regarding rejected takeoff training, he said Bombardier Flexjet had basic SOP (Standard Operating Procedure) guidelines that were used during training at Flight Safety. The guidelines were to abort a takeoff for any problems before 80 knots. After 80 knots and before V_1, an abort would be carried out for an engine fire, engine failure, loss of directional control, or a safety of flight issue. He said during training that they used Bombardier Flexjet procedures for briefings and standard callouts regarding aborted takeoffs.

Mr. Schnieders said the training he received for airplane preflight was conducted using a slide show in the classroom. He said it was not real detailed, it was just enough to satisfy an examiner if he asked questions during the oral exam. During the preflight training he said he was taught to inspect the main gear and tires visually for proper strut inflation, and any anomalies such as cuts or bubbles in the tire or noticeable under inflation of the tires. He was also taught to inspect the main gear assembly and squat switch for damage. He said pilots did not check tire pressure, they only inspected the tires visually and if they looked low, it was up to the pilot to address the situation.

He stated that on the day of this incident, they had picked up the airplane from maintenance and four new tires had been installed. He said they did not look like they were low in pressure. He said at Flexjet they did maintenance inspections “quite often” and maintenance was responsible for checking tire pressure.

Mr. Schnieders said at the company he works for now, they carried tire pressure gauges on board the airplanes, including the Lear 60, and pilots checked tire pressures if there was any question about the tire pressure.

He said he could not really say if the training he received had helped or hindered them in this incident. He said it may have helped a little just by reinforcing memory item procedures. He stated that it was not possible to simulate in training, every scenario that a pilot would encounter. He said he felt that it would have helped if the training had emphasized that when you lost a squat switch, you would lose brakes, engine thrust reversers, and other systems. But he thought this scenario had never occurred on this airplane.

He stated that talking to the mechanic after the event made him aware that there were a lot of items associated with the squat switch and that was probably why they did not have engine thrust reversers. He said runway 1L at IAD was 11,500 feet long and that the airspeed indicator on the Lear 60 did not register below either 40 or 60 knots but he thought they were going 30-40 knots when they went off the runway.

Mr. Schnieders said that after the incident, they left the airplane where it was until maintenance could get the proper equipment to come and get it. He said the right side wheels were "completely destroyed". He said after the incident, the crew went to get drug and alcohol tested and talked to the FAA (Federal Aviation Administration). He said the FAA interviewed the crew and that the crew also provided a written report of the incident and turned it in to Flexjet Flight Operations. He said he never heard anything else about the incident.

After the incident, Mr. Schnieders flew the Lear 60 until August 1998 when he transferred to the Challenger 604. He did not attend any more training events for the Lear 60 after the incident.

Mr. Schnieders said they had executed the aborted takeoff immediately after hearing the blown tire. He said the Lear 60 accelerated very rapidly and they had not used much runway at that point, but he could not recall how much time it took from when they initiated the abort until they went off they end of the runway. He said he did not notice if there were any indications on the flight deck that the engine thrust reversers had stowed.

He could not recall if he and the other pilot had discussed his previous blown tire event prior to this incident but he thought Scott knew it was a blown tire right away. He said that when he encountered a blown tire the first time, when he was jump seating on a Lear 25, it was very obvious what had occurred.

He said he prior to the incident he had not heard any discussion in the Lear 60 community regarding concern over a blown tire taking out a squat switch. He said he heard, several years later, about a Dallas Cowboys Lear 60 that was destroyed when it hit a deer in Alabama. He said he heard that airplane had a problem with the thrust reverser not working. He said he was told that the instructors at Flight Safety tried to recreate the scenario he encountered in IAD in the simulator and had the same results.

Mr. Schnieders said he always knew that the airplane was "under braked" and that the brakes were too small for the airplane. He said the performance was severely limited by brake energy and that was a tell tale sign that the brakes were not adequate. He said it was well know in the Lear 60 community that the brakes were "the Achilles heel" in the Lear 60. He said he heard that Bombardier Learjet had destroyed serial number one doing a high speed abort during testing of the airplane.

He said they were lucky that they were at IAD and not another airport like DCA. He said the tires on the left side of the airplane held up. He said it was a "very violent explosion" that created holes in the flaps and damage to the side of the fuselage on the right side.