Attachment 1

to Operations / Human Performance Group Chairmen's Factual Report

Interview Summaries

DCA09MA021

Table of Contents

Interview: David G. Butler, Continental Airlines, B-737 Accident Captain 1
Interview: Chad G. Levang, Continental Airlines, B-737 Accident First Officer 12
Interview: Richard Lowe, Continental Airlines, B-737 First Officer 21
Interview: Richard T. Greene, Continental Airlines, B-737 Captain..... 27
Interview: Catherine Miller, Continental Airlines, Customer Service Agent 36
Interview: Beverly Dienes, Continental Airlines, Operations Coordinator..... 39
Interview: Clifford Pittman, Continental Airlines, B-737 Fleet Manager..... 41
Interview: John Lumsden, Continental Airlines, B-737 Flight Instructor/ 47
Interview: Jeffrey Bradford, Continental Airlines, Flight Instructor,..... 54
Interview: Joseph Skaptason, Continental Airlines, Check Airman B-737..... 58
Interview: Gabriel Vaisiman, Continental Airlines, Line Check Airman B-737 61
Interview: Dale Clark, Continental Airlines, Line Check Airman B-737..... 65
Interview: Nick Garcia, Continental Airlines, Captain B-737..... 70
Interview: Michael Wood, Continental Airlines, First Officer B-737 74
Interview: Ronald Wind, Continental Airlines, First Officer B-737 77
Interview: Michael Martin, Continental Airlines, Captain B-737..... 79
Interview: Toby Carroll, Continental Airlines, Director of Flight Safety..... 82

INTERVIEW SUMMARIES

A summary of the interviews conducted during the Field Phase of the accident investigation by the Operations/Human Performance Group follows:

Interview:	David G. Butler, Continental Airlines, B-737 Accident Captain
Represented By:	Daniel G. Orfield, Attorney
Date:	December 24, 2008
Time:	1318 MST
Location:	Denver Health Hospital, Denver, Colorado
Present:	Operations/Human Performance Group, Wilson absent

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

Prior to the interview, Captain Butler's attending physician, Philip F. Stahel, M.D., of the Rocky Mountain Regional Trauma Center described the captain's injuries and current medications. He stated that Captain Butler had experienced chest trauma to his left side, involving lateral process fractures where the ribs connect to the spine. He also had serial lumbar spine fractures in the L1, L2, and L3 vertebrae that were stable enough for non-operative management. Medications used in the treatment of his injuries included morphine as needed (last taken several hours ago), Percocet (a combination of oxycodone and acetaminophen) alternated with hydrocodone, and ibuprofen. He had recently been taken off the patient-controlled morphine drip. His last dose of pain medication was Toredal, 15 mg, administered through an intravenous needle one hour prior to the interview. He was also on blood thinners (heparin).

During the interview, Captain Butler stated the following:

He was asked to describe the events leading to the accident. He stated that he and Mr. Levang had been on layover in Denver. They had had a long layover there and had gotten plenty of sleep. The pilots had stayed at the same hotel together, so they had a limo to the airport together and arrived at the airplane an hour prior to push. The airplane was not there yet. Mr. Levang and he had been teamed up in two prior pairings together, which was a little unusual.

Mr. Levang was going to go get coffee and Captain Butler was going to get the paperwork and do the walk-around. They met at the airplane. Captain Butler did the walk-around. He spoke with the crew who was flying the "turn." He was asking them more questions than they were asking him about how the ride had been coming in. It was a really easy-going standard preflight routine. The computers were loaded and the airplane was clean of any write-ups or problems that Captain Butler could see. There was nothing out of the ordinary that stood out during the preflight routine. It was Captain Butler's leg home. Mr. Levang usually loaded up the "box" and Captain Butler would double check his "box." Captain Butler had a checklist he used to make sure all the paperwork was right. Everything was pretty clean.

Captain Butler was not sure what runway they were using because of the winds. They asked and were told runway 34R, and they put that in the “box” so they would not have to reload it later.

The Denver ramp was full of ice and snow. They started both engines and turned the anti-ice and wing anti-ice on directly after the engines were started. This was standard operating procedure when taxiing through ice and snow. Their understanding was that the runway was clear, so before they got to the runway, they de-selected the wings and engine anti-ice, and left the igniters on; at least Captain Butler thought Mr. Levang had left the igniters on.

It was going to be a “heading select off” for runway 34R and “level change top bug” with normal cleanup. They had bugged 6,200 feet for that runway for engine out. There was an airplane in front of them. They were placed in position and hold. They were there a number of minutes. Then they were cleared for takeoff. In the takeoff, they heard winds 270 at 27 knots. They both “raised their ears” because the ATIS had told them 270 at 11. They said roger, crosswind, or something like that that would be audible on the CVR. That was something they had already discussed. For a dry runway it was within limits.

They prepared for takeoff, clocks, lights, gas, and spooled to 40. It was a little squirrely getting to 40 percent. Then they pushed them to 70 percent. As they were going to 70 percent, there was still a little split in the motors, but they did not notice it and when they made the final push to around 90 percent, Captain Butler made sure the engines were pretty well matched. He hit the TOGA button and called out “check power.” Somewhere Mr. Levang called the power checks. Captain Butler was anticipating the crosswind, so he had some left down yoke in there. The winds were from the left. He used right rudder to straighten out the airplane. The wind will try to hit the tail and corkscrew the airplane to turn it into the wind. He started to get up to speed and he had not heard anything from Mr. Levang yet, so he knew he was still under 100 knots. All of a sudden, he felt like something… either one of two things happened. It was like someone had put their hand on the tail of the airplane and weathervaned it to the left, or they might have hit some ice with the rudder in and the tires might not have held with as much rudder as he had in. Captain Butler then put in more right rudder to counteract the yaw. The rudder was pretty much at its stop, and the airplane was heading toward the left edge of the runway. Mr. Levang then said something, as it had gotten his attention. Captain Butler was trying to fight for control of the airplane.

As they got to the edge of the runway, they were looking right at the edge lights. Captain Butler reached down and grabbed the tiller as a last resort to try to steer the airplane back onto the runway. Nothing was working. It looked like they were going to depart the edge of the runway. He took his hands off the tiller, got back on the yoke, and tried to get the wings level. He did not want the back of the airplane to slide down the embankment and cause the airplane to tumble on its side. Captain Butler reached down with his right hand, basically his hands were always on the throttles, but he was “reaching for straws” to do anything he could to keep them out of the weeds. Their vector was still off the runway; however, and it did not work. The captain brought his attention back to the yoke. He made sure the wings were level. His hands were always

on the throttles, and he brought up the buckets and said “rejecting or aborting,” and then they were along for the ride at that point.

He did not remember a lot beyond that. They had two or three thumps and each was very painful. When they came to a stop, Captain Butler was either knocked out or dazed. Fortunately his flight crew was outstanding getting everybody off the airplane. The only thing he could describe was from the time he felt something go wrong to the time they departed the runway, it was like “that” [snapping his fingers]. “It was just, one minute I’m fine, and the next I’m four-wheelin’.” He stated, “I can tell you that I used every bit of my 28 years of flying experience and thousands of hours to not depart the runway.” He stated, “I am so grateful that nobody got killed. I attribute that to the professionalism of my crew.”

Captain Butler stated that he was not sure how he got out of the airplane. He thought someone had carried him, but apparently he had gotten himself to the door. He knew they were both in a lot of pain. That last time, a groan of pain had come out from hitting the ground. He did not recall calling for an evacuation or going through the checklist. The airplane was totally dark at the time. He did not recall any engines running or anything, and he had found out later that they were not on the airplane. Captain Butler slid down the slide and someone helped him up to the fire station.

Captain Butler stated that he just could not reiterate enough how quick it was from everything being just fine to going off. He thought personally it had hit a patch of ice, with that much crosswind and hitting the ice he thought it decoupled the airplane and the airplane had a mind of its own and was not doing anything he told it to do.

When asked whether he could recall anything that transpired after he got to the fire house, Captain Butler said the ambulance ride was very painful. He did not remember much else. Someone in the ambulance was holding his hand. He had made a phone call to his wife while he was in the fire house using someone else’s phone. He kind of remembered those things, but mostly he did not remember anything.

Captain Butler was asked to describe how the engines had been split as he was bringing up the power on the runway. He said they were just a little split. He stated that the flight crews run them to 40 percent first. One was lagging behind by 5 to 8 percent. When he got them both to 40, he pushed them up to 70 and they were still not perfect, but when they got to 90, they were right together and the N1s were matched. The thrust levers may or may not have been split.

Captain Butler was asked to explain what he meant when he said that as they were going down the runway and the airplane had started turning, he had taken his hand off the tiller and placed it on the yoke. He said his right hand was always on the throttles. The time he took his hand off the yoke and went to the tiller was as they were crossing the line off the runway, but it “never grabbed.” He had given it a try for a second or two and then let it go. He added that none of the runways was flat at DEN [Denver International Airport] and he was really afraid of the tail sliding down the embankment first and having the airplane roll. The whole time he was doing this, the right rudder was smashed to the ground.

Asked whether he had noticed any kind of warning or lights, Captain Butler said nothing came up on the master caution at all that he saw. There were no whistles or bells.

When asked whether he kept the right rudder "smashed" as he went off the runway, Captain Butler said, "Once we were going into the boondocks, I was just thinking about aiming for straight and level."

He was asked whether, at any point during the taxi or the early part of the takeoff roll, he had felt any bumpiness or buffeting from the wind. He said no, when they were taxiing out of the gate the ATIS was only a few minutes old and the wind was only 11 knots. It was no big deal. The thing that had caught their attention was when the tower called out 27 knots.

Captain Butler was asked whether, once the airplane had made the "turn" and was going down the runway, whether there was any indication of a crosswind. He stated that he could definitely feel the crosswind, but up to the point of the big yaw, it felt like a normal crosswind takeoff, adding, "You make some adjustments as you're going down the runway."

Captain Butler had been into the Denver airport before, probably dozens of times, but did not know the exact number. He had probably taken off on the same runway, but did not know specifically. In hindsight, he wished he had taken Runway 25.

Asked whether he had performed takeoffs in the kind of winds they were giving, Captain Butler said yes, he had had plenty of crosswind landings. He had had a wet crosswind takeoff at IAH [George Bush Intercontinental/Houston Airport] when he was very junior at Continental. They had been just a couple of knots below the limit on a grooved runway. It was his takeoff on that occasion. He had the cross-controls right. He could feel the aircraft trying to "cut loose" the whole time. He stated, "Now I know why those crosswind limits are important. They are recommended, but you would be a fool to go near them or violate them." He added that he had also flown in and out of Cleveland plenty of times in snow storms so he knew what that was like. Some of those occasions had involved poor weather, wind, and ice, "the whole thing."

Captain Butler was asked if he had received training for operating in crosswinds. He stated that he probably averaged 900+ hours per year and had gotten plenty of practice in terms of proficiency. Every time he went out on a 4-day trip he would catch some weather some place.

Asked to describe the quality of the company's on-the-job training, Captain Butler said that the training department was awesome. He stated that he had been a Navy guy and had received some good training there, but what they had going at Continental right now was better than anything he had ever seen.

Asked whether he had ever faced anything similar to the accident scenario in training, Captain Butler said a few years before the accident he had received special training on crosswind specific takeoff and landing techniques. Every year in maneuvers they would get some type of crosswind, maybe up to 30 knots. Asked whether he had

ever had any training that involved this much force trying to turn the airplane, he said, “In the sim yes.” He stated that the details would be in company training records.

Captain Butler was asked to expand a bit more on what he felt as the airplane was making the big turn toward the side of the runway. He stated that he could explain it in layman’s terms as follows, “I felt my ass end sliding out from underneath me in a sideward motion. The nose was pointing left, and the ass end was pointing the other way without any input on my part. My speculation is that we either got a big nasty gust of wind or that, with the controls we had in, we hit some ice which put us out of parameters.” Asked whether he recalled hearing any unusual sounds at the time of the large yaw, he said no.

Captain Butler was asked to provide a subjective characterization of the difficulty associated with taking off with that level of crosswind, winds 270 at 27 knots. He stated that on a scale of 1-10, the difficulty of handling it while performing a nice smooth takeoff so that people would not notice was 7 out of 10. Asked to describe the difficulty associated with getting it off the ground safely, Mr. Butler said that if he had been concerned about the safety of the takeoff, he would have changed runways.

Captain Butler was asked to describe what he would use as his typical crosswind takeoff technique. He stated that he would set his power. He would have one hand on the tiller and one on the power. He would add the power. He would use the tiller to keep the airplane straight. His right hand would be on the throttle bringing them up, because that was there for the rejected takeoff. Then he would put his hand up to the yoke, then, on this kind of a crosswind, he would steer into the wind. If one did not do that, as the airplane rotated with a lot of crosswind the upwind wing would lift up and it would be really ugly. He stated that one could probably survive the takeoff, but it would be ugly. One would feed rudder to keep it tracking down the centerline.

Captain Butler was asked when during the takeoff he had first put in maximum rudder inputs. He stated that he did not think he had maximum rudder in until the airplane yawed suddenly. He could not tell exactly how much he had in.

Asked whether he had noticed any difference in the performance of airplanes equipped with winglets compared with those without, he said, “Yes a little bit. The winglet birds have a little more inertia.” He stated that once one got them rolling they tended to keep rolling. It took more wheel to stop the roll. He added that “Winglet birds tend to be a little smoother, squeaky clean for handling.” Asked whether he had noted any difference in the crosswind takeoff performance for winglet equipped airplanes, Captain Butler said he did not fly enough of them to notice the difference. The technique would be the same with or without winglets. He stated that he might fly a B-737-500 a couple of times a month. He said he might fly three or four B-737-300 legs or B-737-500 legs in a month. Everyone tried to avoid flying the smaller airplanes as much as possible.

Captain Butler was asked to identify some white pills contained in a blister pack that were found in his suitcase. He stated that they were Imodium. They were probably left over from an intestinal illness he had caught in South America. He had had to go to

a doctor because he was having diarrhea for a week at a time. That had been a long time ago and the pills had been in his bag for ages.

Captain Butler was asked whether he had felt any weathervaning as he was lining up the airplane on the runway and he said no.

Asked to describe his initial correction during the yaw, he said, “You’re just feeding it. Nothing abnormal.”

Captain Butler was asked whether he found taking off in a B-737-800 or B-737-900 to be similar to taking off in a B-737-500 with a short fuselage. He thought landing in the “mid-body 800’s and 900’s” was a little more challenging because one had to carry power almost all the way to the ground. The B-737-500’s were easier to take off, but they were definitely more “squirrely.” They were more sensitive and touchy. The B-737-500 was short and had a big rudder on it. It was sensitive to everything that happened on it.

Captain Butler was asked whether he recalled putting the brakes on as he exited the runway, he said he did not. He did not know, really. He said, “If you reject that is what happens. The RTO procedure takes over.” He stated that the last thing he wanted to do, however, was to interfere with the autobrakes, so he was pretty sure he had not touched them. On the ground the gear had sheared off, he thought.

Asked whether he recalled bringing the throttles back, he stated that as they were leaving the runway he had pulled the throttles back, lifted the buckets and said something about aborting or rejecting.

Asked whether he used his first officer during a crosswind departure, he said no. During the landing he used him. While slowing down and going to a high speed taxiway, he would take his hand off the wheel and go to tiller. He would prebrief his first officer to hold ailerons in the appropriate direction as he did so. He had never heard of using the first officer on takeoff before that way, however.

Asked whether the autobrakes were armed for the takeoff, he said yes, they were set for rejected takeoff.

Captain Butler was 50 years of age.

Asked to describe his aviation background, he stated that he had started in the U.S. Navy’s Officer Candidate School in 1979. After his Navy training he flew the Douglas A-3D Skywarrior. It was a dangerous airplane. He flew it from 1983 to 1986. After that he went to Whidbey Island to fly the Grumman EA-6B Prowler for 8 years. He had had 5 deployments with 600 trap landings. He had spent 3.5 years on an aircraft carrier. He had logged 200 traps at night. Captain Butler got out of the service at the end of 1993. He came out with about 4,500 hours. He was hired at Continental Airlines in 1997. He flew the DC-9 for 1.5 years. Then he went to the B-737 as a first officer. He was guessing he did that for 5 years. Then he spent 2 years on the B-757 and B-767 as a first officer. He was a captain on the B-737 now. He had been a captain on the B-737 for about 14 months.

Asked whether he was a check airman or a management pilot at Continental, Captain Butler said no, but he had been a Navy check pilot. His total pilot time was 13,000 he guessed. He said that his time in type on the B-737 was probably close to 5,000 hours. He had come over to the B-737 in 1999. He had probably over a thousand hours on it as captain.

Asked whether he had any prior accidents, incidents, or violations. He said he had banged a speed-brake on a carrier once. He had not experienced any in commercial flying. Asked whether he had experienced any prior emergencies in civilian flying, he said he had lost an engine on climb out at about 2,000 feet while flying for Continental. It was his leg. He was flying a B-737-300. It was a hot day. The weight was 125,000 lbs. That had been a pretty exciting day. It was a handful. On another occasion he had had a “busted windshield” or a crack. In the Navy he had landed an A3 on the Carl Vincent without any flight hydraulics. That had been fun. He had used electric trim to land.

Asked whether he had been given drug or alcohol screening after the accident, Captain Butler said yes, two ladies had come from the station and taken his urine.

Captain Butler was asked about his activities in the 72 hours before the accident. He said on Wednesday, December 17, he got off at 1022. He said they got in and he took a nap, and then had lunch. He went back and rested some more in San Francisco. He had dinner at a restaurant and had ahi tuna and had a couple of beers. He was in bed about 2000 or 2100.

On Dec. 18th, he was in SFO [San Francisco International Airport] and probably woke about 0600 PST. He had some breakfast in the hotel. He said it was just the two of them, so they got a van ride out to the airport. They flew to IAH with no problems. He was pretty sure there were no issues getting to PHL [Philadelphia International Airport]. He did not recall anything remarkable on the way there, and it had been his leg. He went to bed by 2230 or 2300 EST. He had arrived at the hotel at 2200.

On Dec. 19th he woke about 0800 or 0900. He remembered waking up well rested. He went shopping and bought a little present for his wife. He had some lunch. He said it was a nasty day there so he took a cab out and walked back. They got out of PHL on time, even with all the bad weather there. He said the airplane was a little late getting in. The first officer flew all the way from PHL to DEN. He did not like first officers to get stuck flying into the hubs. He said they were late getting into IAH so they kept that airplane all the way to DEN, which was nice. They got off at 2154 in DEN. He went straight to bed. He said the limo was late and they finally got to the hotel late, around 2300. He went right to bed and was down by 2330.

On Dec. 20th he got up close to 0800. He felt great that morning. He went down and had a little breakfast at the hotel. He met a friend from high school and his wife, who lived in Denver, for lunch. He had two sodas with pomegranate in them and had ahi tuna salad again. He said it was a chilly day to walk around, so he did not walk much. He went back to the hotel and took the van as scheduled at 1630. The limo dropped them off. They took the escalator across the archway, went through security, and came

down the other side. The first officer wanted to get some coffee, so Captain Butler told him to get coffee and he would get the paperwork and do the walk-around.

When asked if he had anything else to eat, he said he had a good breakfast and full lunch so he was not very hungry after that. He did not know if he even had a candy bar in there. He had had lunch about 1400.

He said that when off duty for an extended period of time, he liked to get 8 hours of sleep.

He said his level of alertness at the airport was as clear and as lucid as it could be. He felt good and was anxious to get home. He had had a nice visit with some old friends and all that.

When asked if he was a morning or evening person, he said he was an afternoon person. He said if he could fly from 1600 to 0000 everyday he would do it all the time. He hated early east coast wakeups. He said he did not even drink coffee until he began 0500 pushes from LaGuardia. He said he could not have been any more rested and lucid than he was.

Captain Butler was asked if this was a normal work schedule and he said this was a great work schedule, a “great 4-day.”

When asked if it was typical to be paired with the same first officer for the whole trip, he said yes, but two trips that close together with the same first officer were unusual.

He said his last vacation prior to this trip was the week before. He had a 9 day stretch. He picked up a “red eye turn” in there somewhere. He said it was a Thursday night/Friday morning before this trip.

When asked if he ever received commendations for his performance as a pilot, he said he got a lot of them from the Navy – air medals and commendation medals with V’s. He had combat time and was in the Gulf from 1990-1991. He deployed August of 1990, and got to come back in March of 1991. He did 22 combat missions. His carrier was based in the Red Sea.

He said he had not had any significant changes in his health in the last year, and he actually had lost 25 pounds and gotten in shape. Mr. Butler was told that several Hydroxycut Hardcore diet pills had been found in his suitcase and was asked how long it had been since he had taken any of them. He said it had been a month since he had last taken any of them. He was also asked about some Benadryl and Nyquil pills found in his suitcase. He said he could not recall the last time he took a Benadryl or a Nyquil. He said that was emergency stuff in case someone had a nose block coming down. He said it was probably sitting in his bag for ages.

When asked if he had experienced any significant changes in his financial situation in the last year, he said no and it had actually gotten better.

When asked about any significant changes in his personal life in the last year, he said he had been dealing with a truant child that had required his recent attendance at a court hearing. He said that issue was not weighing on his mind during the accident flight. He said now that the matter was before a judge he was kind of relieved about it. His child lived apart from the captain with the child's mother.

When asked about his health, he said he could go out and run 10 miles and work out in the gym. He was in great shape now, his best shape in years.

He said he did not have any vision or hearing problems.

He said he was not on any prescription medicine before the accident.

He said he last drank alcohol on the evening of the 17th. He had two beers.

He said he smoked a cigar now and again and the 17th was his last use.

He said he had not taken any medication that might have affected his performance in the 72 hours before the accident.

When asked how his workload was on the day of the accident, he said it was "as easy as it gets."

Captain Butler was asked how difficult the takeoff was. He said they called such issues as they faced during the departure "challenges and threats." He said it was high altitude and the weather was clear. They ran the anti-ice on the engines because they would taxi over frozen ice or contaminants and did not want to dent a blade. He said they wanted to make sure they had that off before they reached the runway. They did a reduced power takeoff.

When asked how difficult the overall situation was, with its associated challenges, he said on a scale of 1-10, it would be a 3. It would be easy to forget.

He said there were no distractions during the taxi or initial takeoff.

He said there were no problems with excessive noise or vibration.

He said there were no problems with the visibility or layout of displays or controls during the takeoff.

When asked about the availability of outside visual references during the takeoff, he said it was fine and they had over 10 miles of visibility.

He said he did not have any sleep disorders.

When asked how he liked working for Continental, he said it was a great company. He said he had never felt any external pressures from the company.

He said external pressures from his personal life were the furthest thing from his mind. He said he compartmentalizes well, probably because of his time in the Navy.

When asked about his mood before the accident, he said he was upbeat. He said that the first officer was upbeat also.

Captain Butler was asked how familiar he was with the first officer. He said he was fairly familiar. He personally knew the first officer and his family. He did not have anything bad to say about any of them.

He said he got along with the first officer.

When asked how often he had flown with the first officer in the past, Captain Butler said they had had trips similar to this. They had had a 4 day trip that turned into a 3 day trip just after Thanksgiving. He said they flew once more before that.

Captain Butler was asked about the first officer's proficiency relative to other pilots at the company. He said he was in the top 10 percent.

When asked about the first officer's greatest strengths, he said he was proficient and communicated well. He said the first officer was not afraid to say what he was thinking. When asked if there were areas where the first officer could improve, he said not really.

He said the first officer was a "good old country boy from North Dakota."

He had not heard anyone complain about flying with the first officer.

Captain Butler was asked if he had received any human factors training. He said "absolutely." He said they got a whole day's worth in their upgrade class. He said he also received it back in initial training. He stated that every once in a while when they went in and sat down, there would be a human factors curriculum. It was once every 2 years on that. He also said there was stuff in the newsletters, and there was a human factors newsletter of its own that came out.

When asked if any of his training related to the challenges on the night of the accident, he said yes, that was what their whole threat and error management program was about. When asked to evaluate the quality of the human factors training he had received at Continental he said their human factors training was probably the best in the industry.

When asked about company procedures relevant to the circumstances of the accident, he said that nothing really came to mind. He really felt like to the point where the airplane turned to the left, everything was normal. He said it was like someone hit him with a sledgehammer figuratively speaking. It was a huge surprise to him when it happened.

Captain Butler was asked if there was anything he had not been asked that might be particularly relevant. He said no.

He was asked when he picked up the airplane if he had interacted with the inbound crew, and he said that he did not remember seeing them.

When asked if he had seen the inbound crew at all he said he did not remember seeing them, but he may have. He did not believe he had talked to them but was not sure. He did not think he did. When the airplane came in he thought he was downstairs getting the paperwork. He said they had the wrong gate listed on the overhead display in the airport. He thought his flight was supposed to go out of one gate, but it was actually at another.

He was asked if he recalled seeing the runway lights on when he had lined up with the runway and he said yes, he thought they were on. He had all of his lights on as well. He could see forever with that. He could not recall if the runway had centerline lights, but he thought it did. He said the edge lights were lit up.

Interview:	Chad G. Levang, Continental Airlines, B-737 Accident First Officer
Represented By:	Daniel G. Orfield, Air Line Pilots Association (ALPA) Legal
Date:	December 22, 2008
Time:	0900 MST
Location:	Marriott Gateway Park Hotel, Denver, Colorado
Present:	Operations/Human Performance Group

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

He was 34 years of age.

When asked to provide an overview of his aviation background, Mr. Levang said he went to school at University of North Dakota (UND). After graduation, he was a flight instructor at UND for a year. He was hired by Horizon Air in June 1999 and worked there for almost 8 years. He flew the Dash 8 -200 and -400 series at Horizon, and was based in Portland, Oregon, the whole time, except for one trip in Seattle. He was hired by CAL in March 2007. Mr. Levang's position at CAL was line pilot and he did not have a management position.

Mr. Levang had flown one trip with the accident captain prior to this trip. That trip was his last trip prior to this trip; it occurred the weekend after thanksgiving. In between the two trips, he had maneuvers validation line operational experience (MV LOE), a two-day event done every year at CAL. He had a five day trip scheduled to Bogota, Columbia, but his first two days of that trip were "bought out." The day before he was scheduled to fly the remaining 3 days, he broke a molar and called in sick. Mr. Levang stated that this was the first time he had called in sick at CAL.

Mr. Levang had about 7500 hours total time and 1500 hours in the B-737. He was type rated in the B-737, PIC typed, and has a limitation for VFR circling. Since joining CAL, he has only flown the B-737. He has not been involved in any prior accidents, incidents or violations.

When asked if he had been involved in any other emergencies, Mr. Levang stated that he had one medical emergency where he diverted when he worked for Horizon. The situation was resolved in a good manner. The emergency involved a passenger complaining of severe stomach pains and motor skills were deteriorated. He stated that there was "nothing to write home about" with mechanical issues, but thinks he once lost a generator on a Dash 8.

Mr. Levang stated that was given a drug and alcohol screening the morning after the accident. The night before the screening, he took two hydrocodones. The medications were prescribed by the doctor at Aurora South Medical Center. In addition, he was prescribed Vicodin and Valium, which he got filled yesterday and took some of yesterday. At 0200 this morning he took a valium and hydrocodone.

Mr. Levang was asked to describe the events of the accident day. He stated that the accident day was the fourth day of a four day pairing. The evening before the accident, the flight crew had an overnight in downtown Denver. The show time for the accident flight was 1730. The flight crew arranged for a limo to pick them up at 1630. The flight crew got in the aircraft at 1730. The captain went to get the paperwork and did a walk-around. Mr. Levang proceeded with the preflight safety checks and "receiving aircraft" flow. The captain came back on the airplane and the flight crew briefed and then did the receiving aircraft checklist. The flight crew got the passenger count, got their acculoads, which is performance data for the conditions, and weight. The flight crew inserted the numbers in the FMC [Flight Management Computer] and when they finished, it was time to pushback. They closed the doors, got the pushback clearance from ramp control, and advised them that they had the current ATIS. The flight crew was told to push for a west taxi. The flight crew pushed back, started both engines and talked about some ice in the ramp area. The flight crew discussed that they would start both engines and turn on the ice protection for taxi out. They started the engines, did the after start flow checklist, then turned on ice protection. The captain called for taxi and Mr. Levang called for taxi from ramp control and received clearance to taxi to 3W. As they approached 3W, the flight crew contacted ground and were told to taxi to runway 34R via Foxtrot. Ground told the aircraft in front of the accident aircraft that Sierra was the current ATIS. The flight crew had Sierra. The winds were 270 at 11. The flight crew taxied on Foxtrot and there was a Beech 1900 in front of them. As they approached runway 34R, the flight crew switched to tower control and were told to taxi into position and hold for runway 34R. The aircraft sat there for 2-3 minutes. Prior to that the captain called for the before takeoff checklist and engine ice protection was turned off because weather was good and there was no contamination on the runway. The aircraft was at the position and hold point for 2-3 minutes. A Beech 1900 took off on runway 34L right before the flight was cleared for takeoff. At that point, the flight was cleared for takeoff and tower said that "winds are 270 at 27, cleared for takeoff 34R." The captain said "winds are 270 at 27, you ready?" Per CAL procedures, the captain pushed the throttles to 40 percent to make sure there were two good spools on the engines. Next, the throttles were pushed to 70 percent where the captain engaged the auto-throttles. As the throttles were being pushed up to 70 percent, the captain noted that the throttles were a "little messed up." From that, Mr. Levang gathered that they were not coming up perfectly together. The engines spooled to 90.9 percent, the takeoff power listed on the accuload. The call at that point is "check power." As the monitoring pilot, the call is "power set" and to state the power. Mr. Levang said that the power was set at 90.9 percent. He noticed a .1 to .2 percent decrease on both engines but that was nothing out of the ordinary. The engines stabilized there. The aircraft was rolling down the runway and the next thing that Mr. Levang recalled was watching the airspeed, which came up fairly rapidly. About 87-90 knots, which was before his 100 knots call out, Mr. Levang looked up and saw just a slight deviation to the left of centerline but they were correcting back towards the right. The next thing that he knew was that the aircraft turned about 30-45 degrees to the left towards a black and yellow sign. From Mr. Levang's perspective, there was "zero directional control."

Prior to going off the runway, Mr. Levang remembered feeling the rudders with his feet and that there was full right rudder, "it was on the floor." He also recalled the power levers being back. After that, the aircraft had a big bump and the flight crew made an exclamation after hurting their backs. The nose of the aircraft came up and

then hit down hard a second time, causing the flight crew to cry out or moan. The aircraft came to a stop and the flight crew sat there in pain for 1-2 minutes. Mr. Levang could hear things going on in the cabin and he thought that he needed to make a PA; however, everything was black in the cockpit. Once he “got his wits” about him, his next thought was that he needed to get out of the aircraft and needed to get the captain out. Mr. Levang opened the right window and threw the rope out, and then he saw that the right side of the aircraft was on fire and decided not to go out the window. His next thought was to go out through the cockpit door. As Mr. Levang was getting out of his seat, there was a knock on the door. It was the captain of the deadheading crew. The accident captain was trying to get out of his seat. Mr. Levang moved the captain’s bag out of the way to help him out because it had come dislodged. He helped the captain out and they walked to the slide. The deadheading captain and Mr. Levang were the last off the aircraft. Mr. Levang helped the captain walk to the firehouse. The captain was pretty confused and asked “where are we? What happened?” After Mr. Levang told the captain where they were, the captain asked “What are we doing in Denver? Were we landing or taking off?” The captain asked the last two questions multiple times. At the firehouse, the flight crew were in quite a bit of pain and were lying on the floor. A passenger allowed the flight crew to use his cell phone to call the captain’s wife and then Mr. Levang called his wife. The flight crew let their wives know they were ok.

When asked about the ice protection and what specifically was turned on, Mr. Levang stated that they used the proper sequence – turn on igniters continuous, turn on engine anti-ice, then turn on wing anti-ice. Mr. Levang was asked if wing anti-ice comes on on the ground. He said that it does come on, on the ground, but it turns off when power is added for takeoff.

When asked if there were any clues or cues prior to the left deviation around 87-90 knots, Mr. Levang said no. He stated that the airspeed came up relatively quickly but it was not any more quickly than what he would expect in a normal strong crosswind situation. Mr. Levang said that there were no system warnings or obvious system malfunctions. He stated that there was nothing out of the ordinary about the takeoff roll and that a little bit of weathervaning into the wind was expected, which the flight crew corrected for. Mr. Levang did not recall feeling any rocking of the aircraft and he recalled the windsock that was off to the left that showed a strong crosswind from the left.

Mr. Levang was asked when the flight crew received the aircraft if there was any indication of malfunction. He stated no. Mr. Levang did not look at the maintenance log prior to the flight. When asked if he was the pilot flying, Mr. Levang said no, the captain was.

When asked about whether the rudder was full right, Mr. Levang stated that he did not have his feet on the pedals but as the aircraft exited the runway he put his feet by the pedals to help and make sure the proper correction was being made. Mr. Levang stated that he did not hit the brakes.

Mr. Levang said that it looked like they were going to hit the yellow and black sign but he thought the aircraft stopped a little left of it.

Mr. Levang confirmed that he exited the cockpit through the cockpit door and then went out the L1 door chute. When asked if anyone called for an evacuation, he stated that no one did from the flight deck. He stated that it took 1-2 minutes for the flight crew to get their wits about them and they physically could not do anything at that point. Mr. Levang said he opened the cockpit door and that everybody was already off of the aircraft by that time. He said it was only he and the deadheading captain on the aircraft, except maybe one last flight attendant who exited. Mr. Levang confirmed that the cockpit door was closed for the entire evacuation.

Mr. Levang stated that as he was getting out of the cockpit he specifically remembered seeing that the right throttle was all the way back at the stop with the thrust reverser all the way up and the left throttle looked a little bit forward. He stated that he did not know if it was at full reverser, but it was engaged and looked to be above idle.

When asked if he recalled any reduction in power as the aircraft went off the side of the runway, Mr. Levang stated he did not recall that happening. He stated that it happened so quickly that he did not know how they could have done it.

Mr. Levang said the cockpit was black with no electrical power and he did not recall hearing anything from tower.

Mr. Levang was asked about his experience and training since joining CAL and whether he had received any training for a situation like this. He stated that they did rejected takeoff training and windshear training but this situation was nothing like he had ever seen in the simulator with a total loss of directional control.

Mr. Levang stated that he looked up at 87-90 knots and the next thing he knew, the aircraft was pointed 35-40 degrees off to the left and there was a total loss of directional control.

Mr. Levang did not remember where the aircraft speed was relative to V1, the last airspeed he saw was 87-90 knots. He did not recall the airspeed when the aircraft departed the runway. He stated when he saw 87-90 knots and looked up, he saw a little bit of left deviation from the center line and they were correcting back to the right. He did not get a chance to look back down and verify the 100 knots because the next second he knew, they were heading off the runway.

Mr. Levang confirmed that the nose was on the ground during the entire takeoff roll.

When asked about his activities in the firehouse and how he got to the hospital, Mr. Levang stated that they were doing triage in the firehouse. The captain was taken to the hospital before Mr. Levang along with other people who were more seriously injured. Mr. Levang stated that he was ambulatory and was in pain but could stand. He recalled being one of the last to be taken to the hospital. He was put on a backboard. He was not at the hospital for long, maybe 2 hours. While at the hospital, Mr. Levang talked to Larry from ALPA who told him to go to the Days Inn on Tower Road. He was at the hospital with him at Aurora South. Larry was going to find out where the captain had been taken. After being discharged, Mr. Levang took a cab to the Days Inn and got the

Continental rate. He told the hotel his ID number because he had lost it during the event.

Mr. Levang was asked to describe his activities in the 72 hours before the accident. He stated that on Saturday, December 20, he woke at his hotel between 1000 and 1100. His quality of sleep was “pretty good.” He ate lunch at a restaurant away from the hotel at 1400. He started his duty period at the airport at 1730. He had coffee before departing on the accident flight.

On Friday, December 19, Mr. Levang woke at his hotel between 0800 and 0830 and engaged in routine activities at his hotel. He had gotten “good sleep” and felt refreshed. The captain invited him to go out for breakfast, but he did not have warm clothes and Mr. Levang had a mild sore throat, so he had breakfast at the hotel. He did not leave the hotel until he left for work. At 1415, he and the captain took a van to the airport for a 1500 duty start time. The airplane was late to arrive, because of weather in the northeast, so Mr. Levang picked up some food and a cup of coffee to go, which he later carried on the airplane. He could not remember what time the airplane arrived, but a 1554 duty start time was probably pretty accurate. He completed two legs, PHL to IAH and IAH to DEN. He went off duty at 2154, went directly to his hotel room, watched television, surfed the internet, and read a book. He went to bed between 0100 and 0130.

On Thursday, December 18, he thought he woke about 0800, but he could not remember for certain. His sleep quality was “not great” because of a nap the previous afternoon. He did not leave his hotel before going to work. He reported for duty at 1014. He completed two legs, SFO-IAH and IAH to PHL. He went off duty at 2147 and spent the evening in his hotel room. He did not remember specifically what time he had gone to sleep in Philadelphia, but thought it was probably around midnight.

On Wednesday, December 17, the first officer got off duty about 1022. He went to his hotel, watched television, and took a nap, sleeping from about 1330 until 1600 or 1700. He ate some dinner at the hotel at 2000 or 2100. He went to bed again about midnight.

Mr. Levang stated that he never woke up feeling extraordinarily rested but he liked to get 7-9 hours of sleep per night. He stated he was more of an evening person.

When asked about his normal schedule, he stated that most of the time flight crews did not get long layovers like he and the captain had.

Prior to this trip, Mr. Levang had not worked since his MV LOE on December 2 and 3.

When asked whether he had ever been disciplined for performance, Mr. Levang stated, no.

Mr. Levang stated that on his initial probation MV LOE CQ [maneuvers validation line operational experience continuing qualification], the check pilot filled out a special commendation certificate.

Mr. Levang stated that he had not had any significant changes to his health. He was asked to elaborate on the dental work he recently had. He stated that he broke his molar on December 11 and went to the dentist where he received a temporary crown. The tooth broke far enough down that required a crown lengthening on December 14. After the procedure that night, he took four Advil. The doctor wanted to prescribe loraset but he told him he could not take that because he would be flying. He received a prescription for an antibiotic and a steroid for any bleeding caused by the crown lengthening. The medications were in his bag on the airplane. He stated that the vicodin was prescribed after the accident.

Mr. Levang stated that he had not had any significant changes to his financial situation or personal life in the last year.

Mr. Levang stated he was a fairly healthy individual, and did not have any problems with his vision and hearing.

When asked the name of the doctor he saw for his crown, he could not recall the doctor's name but said he went to Monarch Castle Dental in Conroe, TX.

He stated that he had a prescription for antibiotics and a steroid from his dental work.

Mr. Levang stated he did not drink alcohol. He chewed tobacco occasionally including the morning of the accident.

He stated that he did not take any medications that would have affected his performance in the 72 hours prior to the accident.

On the day of the accident, Mr. Levang stated that his workload was minimal and that he had no work. During the flight sequence, he stated that his workload was very normal.

Mr. Levang stated that there were no distractions or problems with visibility or layout of displays and controls.

Mr. Levang stated that visibility of outside references was good and clear.

Mr. Levang was asked how he liked working for CAL. He stated that he was thrilled to be at CAL and that the company treated him with respect and dignity. His chief pilot was Loyd Robeson.

He stated that there were no external pressures from the company or in his personal life on the day of the accident. He stated that his mood before the accident was pretty good and that earlier in the day he had talked to a friend at the restaurant where he had lunch about being home that evening. He also talked to his wife. He stated that the captain seemed to be in a very good mood that day and seemed well rested.

Mr. Levang stated that he was not familiar with the captain outside of work and had only flown with him on one prior trip. He stated that working with the captain was great and he had no questions or concerns about flying with him. He stated that the captain's CRM and threat and error management was good. He had good communication and good verbalization. When asked to compare the captain to other pilots he said on a scale of 1 to 10, no one was a 10 and rated the captain as an 8 or 9.

Mr. Levang rated the captain's flying proficiency relative to other pilots as a 9 and said he was very competent. When asked about the captain's greatest strengths, he stated that the captain had very good technical and communication skills. He stated that nothing stood out as far as areas for improvement. He did not recall hearing anyone complaining about flying with the captain.

Mr. Levang was asked to discuss any human factors training that he had received. He stated that they went through a course on CRM, threat and error management, and they talked about "verbalize, verify, and monitor." He stated that they went through CRM training every year. He said the quality of human factors training was outstanding. He also received the same type of human factors training every year at Horizon for the last eight years.

When asked about company procedures relevant to the circumstances of the accident, Mr. Levang stated that they were trained on windshear type issues and rejected takeoffs, but he said things happened too quickly to put into effect what the flight crew had been trained on. He stated that the situations experienced in the simulator had been manageable and this situation was not manageable.

Mr. Levang was asked if he checked the passenger cabin and he stated that he looked down the aisle and saw a break in the cabin. He saw no passengers in that area of the aircraft. He asked the deadheading captain if everyone was off the aircraft and he said yes. After that he and the deadheading captain went outside.

When asked if V_1 cuts or rejected takeoffs were done during his last MV, Mr. Levang said they did V_1 cuts but he did not do the rejected takeoff because the captain he was with did it.

Mr. Levang was asked to elaborate on the captain's briefing. He stated that they had a card that went line by line of what needed to be covered. He said that most of the time, pilots stuck with the bottom portion of the card. The flight crew covered which departure procedures would be used, engine out procedures, transition altitude, and terrain off to the west. Mr. Levang did not recall a go/no go discussion in the briefing but said that they had included that in the past.

Mr. Levang stated that the FMC was programmed before they started the pushback.

Mr. Levang did not remember where aileron position was held during position and hold. He said if it were not into the wind he would have noticed.

Mr. Levang stated that as he exited the cockpit, he noticed the right throttle was back with thrust reverser all the way back.

He confirmed that he did not come on the rudders but felt that it was all the way on the floor, full right deflection.

Mr. Levang was asked if he recalled any other verbal communication after the captain said winds were “270 at 27, you ready?” He stated that he did not recall any beyond standard calls. There was no other communication from the captain.

Mr. Levang clarified that the power settings previously stated were N_1.

Mr. Levang stated that he had flown into DEN 4-5 times before but did not recall which runway was used.

When asked if he had a sense of how far down the runway the aircraft was when it departed the runway, he stated that he had looked at the map in the next room and knew now.

He stated that the airplane was configured with Flaps 5.

He was asked if he recalled the speeds for the departure. He thought 137 for V_1, 140 for V_R and 146 for V_2. He said the weight was right at 117,000 pounds so they went with “top bug” of 220 knots, which was the clean maneuvering speed.

When asked if he recalled how much fuel was calculated, he stated that the flight crew calculated 19.7 and dispatch wanted 20,000. He said he calculated this on the pink sheet (the fuel slip), not the FMC. The gauges showed 20-20.1.

He was asked if he saw the flight attendants after the accident. He said yes and that he helped one flight attendant up the hill who had sprained her ankle. He also recalled another individual there, either a captain or a passenger. He stated that the captain was very confused so he went back to help him up the hill. When asked if the flight attendant said anything, he said, no, but she told a passenger taking pictures to get up the hill.

He said by the time they were off the aircraft, there were not many passengers around. He was surprised and not sure where they all went. He said most had gone up the hill to the fire department.

When asked if the captain said anything about what happened, he said, no. and he continued to ask what happened, how did this happen?

Mr. Levang was asked about the crosswind and how manageable it was. He said it was definitely a manageable situation and the limitation on the B-737 on a dry runway is 33 knots. He did not recall all of the times when he had encountered a similar crosswind, but said he had definitely experienced high crosswinds on takeoff. He was not particularly surprised by the north-south runway assignment given that there was a crosswind.

He was asked how his throat was feeling the morning of the accident. He said he had the same sore throat that he had been struggling with but he was not feeling ill or that he had a diminished capacity in any sense. He said he could swallow, and his throat was just scratchy with phlegm. He said his throat felt pretty good on the day of the interview and he did not have soreness.

He said his tooth was not in pain the day of the accident. When he got back from the dentist, he took four Advil and had not experienced any pain since.

Interview:	Richard Lowe, Continental Airlines, B-737 First Officer
Represented By:	Daniel G. Orfield, ALPA Legal
Date:	December 22, 2008
Time:	1413 MST
Location:	Conference call
Present:	Operations/Human Performance Group

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

He was 42 years old.

He was hired by Continental Airlines on November 16, 1998 and was a B-737 line pilot. He did not hold a management position. He had between 10-12,000 hours total time and 7-8000 hours in the B-737. He had been a first officer on the B-737 since he was hired, and was furloughed for 3 years. He also actively flew with the Air Force Reserves.

Mr. Lowe was asked to walk through the events of the accident flight. He stated that everything up to taking the runway was unremarkable, including the flight into DEN. He said that all operations were normal. He felt the engines spool up and they seemed to spool symmetrically. He said the air was as smooth as glass. He said the aircraft was picking up a good amount of speed and the initial part of the roll was smooth. He said normally you can feel side loads, swaying back and forth, but there was no shaking or lateral movement as was normal in gusty conditions. He estimated the airspeed to be at 90-100 knots before there was any indication of a problem. The aircraft went from completely stable to an immediate and excessive yaw to the left. He said it felt excessive because of the speed of the airplane. He said the wheels broke traction with the runway.

This grabbed the attention of the passengers around him. He said a second or two passed and there were signs of the left main leaving the runway surface. He could hear rocks and debris hitting the bottom of the aircraft and engines, like when your truck went off the side of the road. He said the nose yawed right and it felt like the flight crew put in tiller and full right rudder however, the aircraft went to the left. He said that even though the nose was fighting to go right, the aircraft pulled to the left. He said in a “blink of an eye” the right main landing gear was off the runway.

He perceived the engines were spooled with full power as the aircraft exited the runway. He could hear that there was a lot of power on the engines. He did not know if it was reversers or forward thrust. He did not feel that they had lost an engine or lost power to the plane.

As the aircraft was going through the field, it was bumpy and they were traveling in a straight line. He said that what he felt was completely consistent with the aerial view he saw in pictures. He said the aircraft came in contact with the Whiskey Charlie

taxiway in a perpendicular direction and caught some air. When the aircraft came down, the right engine caught fire. He saw the right nacelle and it burst into flames He was sitting in seat 8D and had a clear view of the engine. There was no one to his immediate right and there was a woman sitting at the window. He said the bumps and jolts seemed to get worse and it did not feel like the aircraft was slowing down.

When the aircraft came down, he saw the engine come up from contacting the ground. The webbing between the nacelle and wing seemed to squirt out of the top. He said at that point, he got the sensation that they were going down something. He said it felt like going down a hill of moguls on a sled. He felt the aircraft go off the berm and saw people come up out of their seats and debris flew in the cabin. He said it was a "zero g type maneuver." When the aircraft hit, passengers were thrown back into their seats.

The aircraft then hit a "big one" and he thought that was the utility road. He said that was the biggest impact and the aircraft got "some good air", went airborne and felt like it rolled left and pitched forward. He saw passengers come out of their seats. After the aircraft hit down, there was a very big explosion on the right. He said the fuel tank lost integrity and there was a big fire after that. He said it stayed pretty rough and then came to a stop. He said it did not feel like it was slowing and would end. He said it was fast and then the aircraft was still.

At that point, he looked to the right. He did not notice if the emergency lights or strip lights were on but someone told him that they saw them. He said the cabin was well illuminated because of the fire – the whole wing and wing root were on fire – which was most noticeable where he was sitting and over the wing exit. He said that forward of the bulkhead, he could see light coming into first class and also aft. He unbuckled his seat belt, turned left and the male passenger sitting in the exit row had the door open "ASAP." He knew what he was doing. He said there was a tremendous confluence of passengers trying to exit through the over-wing exit. Five people were trying to get out for everyone one that got out. No one wanted to be second. He could not say how extreme the panic was. He said that the windows were melting and popping. Passengers were screaming "we're gonna burn" and "it's gonna explode." He said lots of people were trying to get out at the same time. Passengers were climbing over seats. It seemed there were 30 people trying to get out of the hole at the same time. He told people to calm down, the aircraft was not going to explode, get through and keep moving. He said there was too much panic and his instructions fell on deaf ears. He saw a male passenger in the back saying things. He looked forward and saw an empty airplane. He saw the first class flight attendant standing on one leg and motioned for us to come forward. He said the aisles aft and forward were packed so he dove across seat tops and used the "army crawl." He grabbed the last two ladies in the aisle and got them to the front to get out. He said there was not really a slide but more like a "padded walkway."

He got the ladies off, went back in the aircraft and the cockpit door opened. He said the pilots were staggering and pretty shaken up. He said the captain was preoccupied with extreme pain and was staggering. He said the first officer was on his feet. He got the flight crew out the L1 door. He came back up again and the first class flight attendant was on the ground because she had injured her ankle. There were no

more passengers on the plane. He helped the flight attendant off the plane and then turned around to run back one more time. He saw the deadheading captain in the aisle and the male aft galley flight attendant. The plane started to fill with smoke. They met in the middle over the wing and started looking for anyone else on the airplane because there were a lot of lap children on the flight. The male aft flight attendant said it was all clear in the back. The deadheading captain asked if he was sure, he said yes, and the captain told him to go back and check one more time.

Mr. Lowe felt that time was running out and was concerned about the tank they were standing on. He said the fire was starting to come up through the floor. He and the deadheading captain got out through the front. He said everyone got as far away from the aircraft as they could at that point.

After he was off of the plane, Mr. Lowe ran down the slide. The only person he saw was the first class flight attendant who was down on the ground. He went over to her and they were sitting there. She was in a lot of pain and could not get up. He picked her up because the fire got bigger. He said the center tank gave way and a river of fuel ran north-south toward the nose and fire was coming behind it. It was starting to "really light off." The entire cabin was on fire. He picked up the flight attendant and moved further west. He sat down with her and gave her his coat. He said that the fire trucks were there within a minute of that. They hosed the airplane and the fire was out in 4 minutes or so. Then a Humvee showed up and he put the flight attendant in the passenger seat and he got in the back. They were driven to the fire station. In the fire station there were lots of supplies – blankets, cots, etc. The fire station was an "oasis." There were people lying on the ground. There was makeshift triage going on. If the fire station had not been there, he felt some people would have been lost to the elements. He said it was really cold and some passengers did not have coats or shoes on and there was a lot of "powder" outside.

Mr. Lowe stated that what stood out in his mind was the composure of the flight attendants. He said that the first class flight attendant was stoic. She was very matter of fact and told passengers to drop everything and keep moving. It was the same in the back. The male aft flight attendant walked through fire to save people. He was humbled by what they did to get them off the airplane. The first class flight attendant never lost her composure until after all passengers were off of the plane and then she collapsed in the galley. It was unbelievable what they did.

He clarified that the male aft flight attendant did not literally walk through flames but the fire was encroaching. He said he could have turned and run but he still searched every row and searched through pillows, blankets and luggage on the floor to make sure no one was there. He said the male flight attendant disregarded his own safety. Mr. Lowe said that stood out as remarkable in his mind. He said the flight attendants were real heroes.

Mr. Lowe was familiar with the cabin crew because they were the same crew that were on the earlier flight in from IAH. His flight to Newark got canceled so he and the captain were excited to deadhead back. They went to the back and relaxed.

Mr. Felipe and Ms. Howard were in the back and Ms. Ressler was at the front. Mr. Lowe said he was at the over-wing exit trying to get people out. He said the over-wing exit was the bottleneck and it seemed like a mass of people had converged on the exit they saw rather than the one that was most free. One or more of the other exits were obscured by bulkheads. He said the middle of the cabin was illuminated best and all passengers made a beeline for that exit. He said the plane was evacuated in less than 90 seconds. He felt that it could have been one minute if people had not dwelled in the middle. He said it was panic and chaos that led to that and everyone was converging from the left, middle and right. There was a lot of wasted time in the panic and everyone was not orderly. They tried to slow them down and maintain order. The strongest person made it through. He said there was a male passenger who ran over a woman who had kids in her arms and passengers screamed to get her up because she had children with her. He said because of the fire it was the most extreme human behavior he had ever seen and frantic was not the word for it.

He said that everyone knew to get out of the “tube” as soon as possible. The male aft flight attendant tried to call the cockpit a couple of times but got no response. The flight attendants looked out the windows and made the decision to evacuate. He knew that they were not going out the right because of the fire and it was already melting. He could not see much in the back because he was in the middle. He said panels fell and wires were coming from the ceiling. He did not go to the back but said it appeared empty, as did the front. He tried to get people to go to the front or back. He thought if they stayed where they were, it could have been another 30 seconds to evacuate. He said there was too much panic and the line was not moving. Once he was back in the plane, he was surprised to find the aircraft empty. They had managed to work it out at the over-wing exit. He said he thought the male aft flight attendant peeled people away from the mass and got them to the back door. The over-wing exit thinned out pretty quickly. He said people were so desperate to get off they were climbing over seats to get to the over-wing exit. They were skipping the line. He said it would have been nice to have had two exits over the wing like the B-737-800. There was certainly good reason for those.

When asked if he had experienced something like this before, Mr. Lowe said he had been in a terrible car accident in high school. The vehicle rolled many times and went down a ravine. He said it was very similar except there was no fire. He said he talked to his family the night before the accident and they talked about all of the things he had been through.

Mr. Lowe was asked how his training and background affected him. He said the fire was a “big big motivator” and he wanted off too. He said that the epitome of the training in action was the flight attendants. The majority of the flight crew training pertained to working from the cockpit. He said he found himself in the middle of these people and acted like a first responder. He said his training taught him to try and remain calm and instill calmness in others. He said as pilots they are trained to “take a deep breath and slow down to go fast.” He tried to gather as many facts in his mind as he could. He said the eeriest part, once the plane was empty, was going up and down the aisles looking for people. He felt like the sand was running out of the hourglass. He said everyone had gotten off and they were still on the airplane looking around. He was

thinking the airplane was going to blow up with them still on it. When he was in there by himself it was pretty scary.

Mr. Lowe was asked if he recalled any maintenance discrepancies on his flight into DEN. He said all was “good to go.” He recalled that the captain looked through the maintenance log while he did the walk-around. He did not see anything in the logbook of note.

He said he had not flown with the captain involved in the accident. He had flown with the deadheading captain before but not the accident flight crew.

He said that after all passengers were off the airplane, he was on the plane another 30-45 seconds. He said they did a thorough search but also an expeditious one.

Mr. Lowe was asked how many times he got back on the aircraft after he got off. He said 3 times.

Mr. Lowe clarified that he was sitting in seat 8D.

Mr. Lowe did not hear an evacuation call over the intercom but did hear the flight attendants giving their commands. The most audible thing was the panic and screaming from the people.

Mr. Lowe was asked when the aircraft veered left if it was a snap or side force. He said that he would categorize it as pretty abrupt. He said if he had to put his money on it, it seemed like a massive and instantaneous gust of wind blew the tail. He said it was all smooth and normal, and then a huge yaw and side load. He said the wheels were skidding and trying to grab the runway. He said it was like taking a high speed taxiway a little too fast. He could feel the wheels hopping and skipping, but as they grabbed the thrust pushed the aircraft. He felt the nose fighting to go right. He said it felt like the nose came back in alignment but the left main landing gear was already off and there was a 10:30 to 11 o’clock direction of motion for the plane. He compared it to pulling into the “J–line” a little too fast with ice or snow, but on a much bigger scale. He said it was abrupt and definitive for the amount of speed of the airplane. He knew right away it was not going to go well.

Mr. Lowe was asked if he had any suggestions to help in the future. He said evacuation slides that are bright yellow or fluorescent orange would help. The slides on the accident aircraft were kind of hard to see. That was his thought and the flight attendants communicated that to him. After running out and trying to get back in, he said that would have helped a lot. He also said two exits are better than one and a bigger one is better than a smaller one.

He also said there was confusion at the fire station. He thought it would be good if each company had a crash response kit which included fluorescent bracelets. He said the ladies there from CAL were trying to get all of the passenger names and dates of birth but people were moving and it was hard to account for everyone. If they could have gotten a bracelet to everybody, that would have saved a tremendous amount of

time. Once everyone was up there, they were trying to account for people and asked if they had accounted for everyone. He felt the situation would have been worse if the fire station had not been there because it took awhile and it was very cold outside. He said the firemen were awesome and the CAL ladies' organizational abilities were outstanding. They took control and helped people to the degree they did. It was pretty impressive.

He said he was the last one out of the fire station and that was around 2200.

He was asked how long others were at the fire station. He said the captain was out first in an ambulance. He said as firemen and paramedics got people on backboards and braces, the room thinned out. He said passengers were lined up single file in the garage where the trucks park. He said getting information from people took the longest. He said everyone filed on a bus and were taken to the terminal and the President's Club. He waited for one last bus and ran through the station one last time to make sure everyone was out. He said the deadheading captain was the last one out on an ambulance.

When asked where he went after he left the fire station, Mr. Lowe stated that he went to the terminal. He thinks that they parked on the CAL jetway and he and the female aft flight attendant were split from the passengers. They were met by CAL personnel and were asked to discuss facts of the event for about an hour or so before taken to the hotel. The two other flight attendants had gotten to the hotel just before them. They sat there for 30 minutes or so before two additional CAL personnel came to meet them. They did drug and alcohol testing for the three flight attendants then they got something to eat. He turned in and went to bed at 0330 or so. He was told that he did not have to do a drug and alcohol test because he was riding in the back but he took the breathalyzer but not the drug test.

Mr. Lowe said that he tried to help the cockpit captain to his feet. He tried to help the captain down but he went down under his own power. He said the biggest thing was getting him out of the cockpit. He and the first class flight attendant were helping the captain. When asked if the captain's feet were trapped, he said when the door opened he saw the captain on all fours and the captain grimaced in pain. The first officer was on his feet behind the captain. The captain got to his feet and was just delirious from pain with his back.

Mr. Lowe said that he did not receive any injuries.

He was really impressed with how well the airplane held together.

Interview:	Richard T. Greene, Continental Airlines, B-737 Captain
Represented By:	Daniel G. Orfield, ALPA Legal
Date:	December 23, 2008
Time:	0835 MST
Location:	Conference call
Present:	Operations/Human Performance Group

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

Captain Greene was 49 years old. He was hired by CAL on 31 August 1987. He was a line pilot and had not held a management position with the company. He had over 16,000 hours of total time and had flown as a captain in the B-737 for three years for about 2000-2200 hours in type. He got about 800 hours per year.

Captain Greene was asked to walk through the day of the accident starting with the flight inbound to DEN. He stated that the aircraft operated normally on the way in. They got to the gate, but things were unfolding as he was supposed to fly from DEN to Newark International Airport (EWR). He found out when in range that he was deadheading back to IAH with the cabin crew as crewmembers. He and the first officer were trying to figure out if they needed to get out of the cockpit. They filled out the log, got the plane loaded with fuel and got out of the aircraft. There was a fairly quick change of crew so he wanted to get out of the way. They put their bags in the back and got out quickly.

He and the first officer got off the plane, talked to the gate agent and got their seats. The only interaction he had with the crew was to tell them it was a decent ride coming in from IAH, a little bumpy but once at around 12-13,000 feet it should be smooth. He did not get into detail about the winds and they did not seem that bad at the gate. There was nothing abnormal about the aircraft and he told the accident crew there was nothing wrong with the aircraft.

He said by that time they got on the plane and sat down. Everything was to CAL standards – PA information from crew about flight. The taxi was perfectly normal. He said conditions on the ramp were hard packed ice from the gate to most of the taxi J lines. It was not blowing or anything like that. He said both engines were started and the flight taxied out.

Captain Greene recalled that he ended his last trip out of DEN mid-last week. He did not think they had too much snow because the runway was dry and taxiways were clear on the east side. He could only assume that the west side of the airport was the same.

He said the PA for takeoff was normal. The aircraft got on the runway and started to take off. The lady who sat next to him had a cold and he chatted with her for a few minutes. He was seated in 1B, right at the bulkhead in first class. He looked at the

bulkhead wall so had no periphery view on the roll. He recalled that winds were 290 when he landed earlier and gusty, but it did not seem to be gusty as the flight taxied out. It did not feel like the aircraft slid around. There was no shimmy or shake. There was normal braking. They got the PA for takeoff and flight attendants to be seated. Power was added and he did not feel any giant wind gusts or anything. As the aircraft accelerated he said everything seemed pretty normal.

At some point, at least 15 seconds down the takeoff roll, he said they got hit or slammed by a big gust of wind and the aircraft yawed to the left. He could not give a speed because he had no peripheral view because the lady's head blocked the window. He felt the aircraft starting to go sideways and it put side stress on the landing gear. He got inertia or a sick feeling that this was not right. As soon as it happened, there was a correction to get the aircraft straight. The sound of tire shimmy diminished and the inertia feeling of going sideways to the left stopped. Almost instantaneously, he felt the left mains on the edge of the runway then it started to increase and it was clear that they were starting to go off to the left side of the runway. It continually got rougher and rougher and it was clear that we had left the runway. He had no idea where they were or what side of the airport they were on. It was getting rough and bouncing. He figured they would be stopping soon. It got rougher and they hit something that made them bounce really hard. He could not say if they were airborne because it was rough. The second bump was really hard and that was when people hurt their backs. The third time they went airborne and he thought they were probably going down the ravine. He prayed the nose would not crush in and he would be able to get off the aircraft. The final impact was softer than he expected. The aircraft came to a stop and they all unbuckled. Just prior to the stop, one male passenger ran to the front of the aircraft. The forward flight attendant told him not yet and to stay still.

Captain Greene did not see the fire out the ride side on takeoff roll. He remembered when they stopped that he saw flames out the right side and that got everyone going and eager to get off the aircraft. The male passenger who ran to the front either helped the forward flight attendant or waited until she got the exit door open. Captain Greene and the female passenger seated next to him were both hurt. They stood up and the female passenger next to him collapsed. He told her to stay there and he would be right with her. Her husband, who was not in first class, appeared and stayed with her. Captain Greene reassured her he would get her off the airplane.

He said what happened next "felt like an eternity but it wasn't." He heard the forward flight attendant repeat to passengers to get off the aircraft and to come that way. He said everyone was virtually off the aircraft in less than 10 seconds. The roof panels in the middle of the row had swung down and were still swinging. He tried to keep them out of the way as people went by because he knew they would get hurt because they swung so fast. He was hit by several people going by. He finally got the panels up and locked into place. He looked at the cockpit and the forward flight attendant was standing on one leg holding herself up. The cockpit door was closed.

He went toward the back and got three panels up and locked. He said there were still a lot of people exiting at the emergency exit row. It was more orderly. The deadheading first officer went to the over-wing exit first. Captain Greene looked back towards the front and saw it was pretty clear. He said the man and his wife (the female

passenger next to him) got out of the aircraft. He then turned around and looked under seats. Two passengers tried to get something from the overhead bins. He told them to leave the aircraft and pointed to the exit and they did.

He said the fire was getting more intense. He could see a breech in the cabin just aft of the exit row. He saw the emergency lights on but could not see past the breech because it was dark in the back. He saw flames from the first class windows to the over-wing exit. He said he did not feel any heat initially.

Captain Greene said that within 30 seconds there were very few people on the airplane. It was probably 45 seconds before everyone was gone. He went back forward to assess where they were with the evaluation. The female passenger sitting next to him was gone and the forward flight attendant was holding herself up. He said the deadheading first officer got off of the aircraft a couple of times but was back. They went to the cockpit door and it opened at some point. The captain was out of his seat between the pedestal and cockpit door and was in excruciating pain. He said both pilots were very injured but the first officer was able to move. He said they looked dazed from the impact. He knew they had some wounds but did not recall a lot of bleeding. This was the same with the passengers. They seemed relatively ok, aside from the shock of impact and back injuries.

He got the pilot out and got the crew moving. He did not remember doing much lifting because he was in pain. He said he was running on adrenaline. At some point, the forward flight attendant got off. He was not sure if she helped the flight crew off or the other way around.

He heard later that there was a problem with the color of the slides but they deployed as planned. Next, he started looking back through the rows. He started smelling smoke or something burning. He did not see it billowing in where he was.

The male aft galley flight attendant got people out and jumped back and forth over the breech at least twice. Captain Greene went back to the back and did not see anyone. At about this time he ordered a male passenger standing at an exit looking around out of the aircraft. He asked the male flight attendant if everyone was out. The male flight attendant said he thought so but would check and ran back to check. Captain Greene could not see because it was dark but assumed the fire was not there yet. He could not see any lighting back there. It was dark and a few panels were down and a few overheads were open.

The male flight attendant was back and said everyone was out. He asked him if he had checked under the seats because there were children onboard including two being held. They made sure everyone was out, and he told the flight attendant it was time to leave. Captain Greene went to the wing exit and the male flight attendant disappeared. Captain Greene went back out the forward entry. Before he exited, he picked up his jacket because it was cold outside. He exited the aircraft and saw no one. He was nearsighted and was not wearing his glasses but could tell no one was out there.

Mr. Greene saw something at the top of the hill and ascertained it was a firehouse. At that time he noticed that 10 people were headed up to the firehouse. He wondered where they were going. He ran into the female passenger who had sat next to him and she was with her husband and in pain. He blocked the wind for them and told them to get to the firehouse. He and her husband carried her up to the firehouse. They stopped because they needed to catch a break from the back pain. Halfway up the hill, they ran into the male flight attendant who had just taken someone up the hill. The deadheading first officer was doing the same thing. There were just a few people looking at the aircraft and he told them to get away from the aircraft and come this way. They did.

He said at no time during the evacuation was there any fire or smoke. He felt at peace walking through the aircraft and he was not worried about anything. He did not know why, he just did it. At some point, his wife said he called her as he went up the hill.

Captain Greene went up the hill to the firehouse to make sure everyone was there. He went in the back door where the kitchen was. The female passenger was lying on the table. The captain and first officer came in and were very ashen. The captain was in excruciating pain, bent over, and he slowly lay down.

He looked around to see if everyone was there. He went to the bay area with the trucks where less injured people were. He ran into the female aft galley flight attendant so he knew she was off. She and the male flight attendant got everyone off the back of the aircraft. Once he made sure all the crew was off and counted passengers, he asked them how they were and let them know help would be there soon.

During the evacuation, the passengers were at the firehouse before the fire crews and emergency help got to them. At some point, he was asked by an emergency official to please call dispatch. He used his cell phone and was patched through to the chief dispatch or an emergency individual. He gave them a brief synopsis of what happened, the status of passengers and the status of the aircraft. He told them the aircraft was in flames, about the break in the hull and that he saw the slides had deployed on the left side. He said the conditions were windy but there was no blowing snow. He told them that there were roughly 20 people with head, back and neck injuries. One male passenger had a large contusion to his head with a slight cut. He told dispatch they were at station 4 because someone had told him that, and the aircraft was not too far in a ravine. He told them he would keep his cell phone on and to call him back.

He went around the room just talking to passengers and asking how they were. Maintenance personnel arrived and a CAL “red coat” came in. They said the buses were coming and gave them a scenario of what would happen next. He ran into what he thought was one of CAL’s pilots but he was a corporate pilot on the flight. He asked him what he felt and what he said mirrored what Captain Greene said. They were on the takeoff roll and something hit them and turned them sideways. Maintenance asked him what he felt. He told them the engines were normal and he did not hear or see anything. He told them there were no problems with the aircraft on the way in – the braking, auto systems, breakers, spoilers, reversers were all “A OK.” He told them about the flames.

From that point on, he was talking to passengers and the ambulances showed up. At some point the passengers were taken to the main terminal. He told them he would stay until everyone was finished. The captain and the first officer left for the hospital. The captain was more severely injured than the first officer. Some people told Captain Greene that he looked like he needed to go as well. He told them to take everyone else first and then he asked them to take him to the hospital.

He went to the hospital and he had a hairline crack on the T12 vertebrae. He did not have cuts or lacerations. He was pleased and surprised that there were not more head lacerations due to the crash. Beyond that, he could not think of anything else that went on. He was just doing his job. He said the CAL emergency plans that should have been happening were happening.

Captain Greene was asked to go back to the takeoff roll and for any sense of power level or change in power as the aircraft left the runway. He said no and that it felt like any other takeoff. He said it seemed that the engines were right where they needed to be. What he assumed to be a gust of wind turned them. He did not hear a popping with the engine. He had experienced an engine loss on takeoff in a DC-9 at 100 knots. He said they lost the fuel pump and the engine spooled down gradually. They just rolled down the runway, saw the exit and left. He said he was familiar with that and what it would sound like but in this case he did not hear or feel that. He felt like they were trying to arrest the skid and get it straight. That was when he felt the tires hit something and drag them off the runway. He could not state what the status of the engines were because of the shock of it all. He did not know if they were at takeoff power or retarded because it was too violent. He thought they corrected it because it felt like they were going straight. Then it got really rough and he realized, “no, we’re going off.”

Captain Greene clarified that the male passenger he saw running forward was not the male flight attendant. He thought it could have been the female passenger’s husband but he did not know. The passenger was running forward but the aircraft had not stopped yet and the deceleration may have pushed him forward. He thought he was running for the exit as he was in a position to see the flames before Captain Greene did. He may have recalled seeing flames briefly before the aircraft stopped but not sure exactly where.

Captain Greene clarified that the overhead panels in the center aisle had fallen. He said they hinge on the aircraft right in the aisle and they were down and swinging back and forth. He pushed it back and that was how he got hit. He said he was 6’ 3” and was holding it back and people holding babies hit him a couple of times. He jumped on the other side and pushed the panel up, got hit by another passenger and fortunately locked it back in place. He said the panels did not malfunction but just came undone.

After working with the panels, Captain Greene looked to see if everyone was off. He said it felt like an eternity. He looked forward but could not recall if he went forward. He was not sure about the intensity of the fire but thought it was not that bad yet. He left the aircraft as the windows started to melt. He looked both ways and thought he went aft first because first class was clear. It only had eight seats. He said everyone appeared almost off of the aircraft and he was talking to the male flight attendant and

said it was “time to get the pit.” He said the cockpit door was closed, then it was open and the captain was on the floor with the first officer helping him.

He said he did not open the cockpit door. He did not know if the door opened automatically because of a loss of power. He did not know how or who opened the door.

When asked if the L1 slide worked correctly, he said yes and everyone was off quickly.

Captain Greene was asked to clarify the problem he referenced to the color of the slides. He said he heard that later and that the gray was hard to distinguish. He said he clearly saw it. He said he walked down it, fell forward towards the aircraft and rolled off that way. He could clearly tell where the slide was and that it was inflated. He did not think about the color; he only knew it was a slide and it deployed correctly. The color was not an issue for him.

Captain Greene was asked if he boarded with the passengers. He said he waited a little while and then went down the jetway. He said it is a nuisance to have crew at the door with a B-737-500. He and the deadheading first officer put their bags in the aircraft on the right side. He noted that they were now gone. Before he exited the aircraft, he got his wallet from his overnight bag. He went back to the gate and sat with the passengers.

He said that the deadheading first officer handed him his seat assignment in the gate area. He said thanks and was shocked that he got to sit in first class.

Captain Green was asked if he heard any announcements. He said the announcements were standard in nature and the flight attendants did PAs. He was asked if any announcements were made at the gate. He said he did not hear anything there. He said Merry Christmas to the people at the gate and was glad he got first class. He did not hear PAs about being delayed or any sort of delays.

Captain Greene said there was nothing wrong with the airplane and he had not called maintenance to look at the aircraft. He had maintenance look at the aircraft in IAH, they put engine oil in and everything was fine.

When asked how long he was in the firehouse before departing for the hospital, he said he got there somewhere around 1830 and got to the hospital around 2200 or 2300. He was at the hospital until 0200 as they had to read his x-rays and there were several people there being worked on. He was at the firehouse until 1830, 1930, or 2100.

He did not know the accident crew. He said not being a first officer on the aircraft before; he did not know the crews that well. He also did not know where they were in their pairing.

Captain Greene was asked what cues he used to base his inference on about the wind gust. He said the engines were still spooled and were not reversing. He said it just felt like a “big giant push.” He thought they were 15 seconds down the takeoff roll,

but 20-30 seconds at the most. He was asked if it was instantaneous or whether it continued for several seconds. He said the push was instantaneous, “bam” and said to himself, “this doesn’t feel right.” The inertia turned him in his seat. He said as quick as it had come, it ended, and they were going sideways or almost that way. They were clearly not tracking down the centerline. As soon as that finished, he said it appeared that they were trying to get straight again. He said it felt like it was better but then it was not.

When asked if he heard any sounds at the time of the push, he said from his vantage point, he did not hear any unusual sounds other than the wheels and knowing they were not rolling down the runway.

He did not talk to the captain or first officer at the firehouse because they were being treated. He just made sure they were okay.

Captain Greene said that he got his wallet out of his fanny pack. As he was walking out, he saw his computer bag on the floor and threw it out and grabbed his jacket and went out the aircraft. He said the last three people off of the aircraft were the male flight attendant, himself and someone else. He thought the deadheading first officer probably helped the forward flight attendant out. He said he and the crew got off almost instantaneously together.

He said the fire was forward of the first class galley. He said the actual crew of the aircraft was off and he commanded that it was time to get off. The windows were starting to melt and there would be a breech soon.

Captain Greene was asked if he had any concerns about the takeoff and what the plane could handle with the crosswind. He said when he came in the winds were 290 at 17, gusting to 27 or 28. He carried an additive and at the outer marker got a windshear alert. That distracted him briefly. He got the gear down and asked the inbound first officer to get the winds on their side. The winds were steady from 290 “at half that.” The inbound first officer changed the speed additive in the box real fast. He elected not to take out the gust factor. On landing, he lost some airspeed but it was manageable and was arrested with power. He assumed the winds were similar to the 290 heading but did not know velocity at the time of departure. When asked if winds at 290 at 17 knots and gust to 27 concerned him departing on 34R, he said he would use full power. He said with Doppler windshear he would wait and see what the conditions were and act accordingly. He said they were on one of the longest runways. He would prepare for full power and the left crosswind takeoff.

When asked if he had any sensations of engine spool as the aircraft left the runway, he said he honestly could not tell if they were stopping or in go mode. He said normally when sitting farther back he has periphery, but he did not have that. He said he can only go with the intensity and it appeared the engines were working. He had aborted at 100 knots before and said it is a quick and violent procedure. He did not feel any of that.

He said the gear was not dragging, it just exited the runway.

He said that the corporate pilot passenger flew Lear jets and prop planes.

Captain Greene was asked how difficult a takeoff was with those winds. He said it was a challenging takeoff. Full power would be used, ailerons held into the wind, and the yoke down. He said of all planes, the B-737-500 was least favored for a stiff crosswind because of its short length, but he said it would be manageable. He said the difference would be the nature of a blast hitting the tail at a relatively low airspeed and the relative ineffectiveness of the rudder at that point.

He said he would have the first officer hold the yoke and ailerons in position. He would bring the engines up slower to make sure they were “plenty spooled.” He would bring the throttles up far enough before engaging the auto-throttles to know where they are. His hand would still be on the tiller briefly. Once he saw he had good authority, he would bring in the rudder as necessary to hold the tail to the left. That would be his technique. He would keep the upwind wing down.

When asked if he would have the wheel turned into the wind, he said, yes, because he would want it ready. He said it would be the same as when landing. He would have the first officer hold the yoke into the wind until they could be slowed down. He said he might be holding on to the tiller during the initial roll but not the whole takeoff.

He said once the throttle was up and had power, he would grab the yoke. It would be based on a “seat of the pants” feel. He said initially he would have kept his hand on the tiller until the engines all spooled up until the autothrottles were engaged. This was less than five seconds to transition.

Captain Greene was asked what he meant about the first officer holding the yoke. He said it would be turned into the wind so when he took it, it would be where he wanted it. The first officer would not fly the airplane. He said he would want to maintain correction after landing and during the early part of takeoff. He would apply a little forward pressure as well because some runways are bumpy and he would not want the nose to bounce, but this runway was smooth.

He said the strain he felt in his seatbelt was definitely a “we’re not going straight.” He said it was almost like a snap, like a good shove, like it pushed the tail to the right and nose to the left.

When asked how he thought winglets affected crosswind takeoffs and landings, he said he first experienced winglets on the 757. He said other than floating slightly on the landing, he got used to the effects on landing. He said on takeoff it felt more stable. He did not think they caused a problem. He said after awhile he got used to them. He said they often switch between aircraft with and without winglets but the procedures would be the same. He said winglets felt different at first during landing. He said when they have a “nice clean wing out there,” the aircraft flew a little better. He said it was not unmanageable, just a transition on the design.

Captain Greene was asked what medication he was taking for his back. He said he took hydrocodone for his back pain and a muscle relaxer that he took once a day. He

said he had spasms around the back area and had a brace to use as necessary for standing or sitting for long periods. He said he had a light fracture at T12. At the hospital, they told him he did not have a hematoma near the crack. He did not take any hydrocodone the morning of the interview because the muscle relaxer helped. He could not sit or stand at first. The night before the interview he took hydrocodone around 2200 and the muscle relaxer at 2030.

When asked if he could suggest anything to help, he said when it came to what the flight attendants did prior to, during, and after the accident, he thought it went very well. He said because he was not in the cockpit he did not know. He said for the aftermath, if he and the deadheading first officer had not been there, he was sure that they would have gotten the passengers off. He said the forward flight attendant would not have been able to help much because of her leg and the male aft flight attendant was a trooper.

He said company emergency procedures worked well. As a critique for CAL, he said it felt like forever when they were waiting. The fire personnel got out there but they wanted a point person to talk to. He said he took that role and people asked him questions. He said most of the questions were whether any passengers were left on the aircraft and maintenance staff asked him what was going on and about the aircraft because he had taken it in. He said it would have been nice to have someone there to help him through it all. He said the fire crew was excellent.

Interview:	Catherine Miller, Continental Airlines, Customer Service Agent
Represented By:	Daniel G. Orfield, ALPA Legal
Date:	December 23, 2008
Time:	1517 MST
Location:	Marriott Gateway Park Hotel, Denver, Colorado
Present:	Operations/Human Performance Group

During the interview, Ms. Miller stated the following information:

She had been working for CAL for 27 year and was at the Denver base the whole time. When asked about what position she worked the day of the accident, she stated that she worked the gates that day. She said she could do anything regarding different positions at the airport. She had worked many positions including, freight, ramp, ticket counter, and President's club.

Ms. Miller was asked to describe the events of the accident day. She stated that it was originally supposed to be her day off. She started at 0900 that morning and was to go to the President's Club. Before she got there, there were delays so things were not going so good. She was then told she was going to the concourse and the person there went to the President's Club. The other woman had been the lead on flight 1404 so Ms. Miller now became the lead on flight 1404. She stated that as the lead she met the aircraft, got all the paperwork done, checked off the crew, and was in control of the aircraft and anything that happened to it while it was at the gate. She said flight 1550 was leaving the same gate and flight 1404 was supposed to be there a little before 1700 so she went to get her paperwork and then came back. She said the flight came in about 1710.

While checking the flight in, she stated that the accident captain was the first to show up. He came from the hotel, and she knew him from him flying in and out of DEN. Ms. Miller asked him how his layover was and if he had fun. While they talked, she said that the accident captain stayed to her right. They talked for awhile and she just asked how his layover was. He said it was fine and did not mention what he did. Ms. Miller stated that she thought he was a quiet guy, even when she talked to him before. She then told him that it was a full airplane but there were no jumpseaters. She stated that she liked to talk to her crewmembers. He did not say much but stayed there at the podium even while the airplane was "downloading." She stated the she had not seen the accident first officer yet. She said it was normal for the flight crew to get food, especially when they come from downtown. He arrived maybe 5-8 minutes later.

She said the airplane was in and downloading. The accident crew was there, and then shortly after the inbound crew, the PS0 [Positive Space 0] first officer and captain that brought the aircraft in came. Ms. Miller told them that their flight to Newark was cancelled. She felt that the deadhead crew did not have good seats so she reassigned them. There was a couple that did not want to separate so she had one seat open up in first class and said one of the deadheading crew could sit there. They decided that the

deadhead captain would sit up there. The deadheading crew did not say anything about the inbound flight. She stated that she had trouble getting the blocked seat assigned for him. The deadheading crew went off to dinner. When they came back, she still had not got the blocked seat booked. That was how the deadheading captain ended up in seat 1B. She said that row 8 was blocked. The deadhead captain would be in 8F and the deadhead first officer would be in 8D. The deadheading crew stayed up by the podium until about 10 minutes before departure.

The accident crew was no longer at the gate. Ms. Miller gave the accident captain the combination to get outside on to the jetway so they could load the plane. When the accident first officer arrived at the gate she told him she had never seen him before, and then checked his ID and checked him off. She stated that she really did not talk to him at all, and she liked to know who her deadheads and employees were.

Afterwards she stated that there were 3 missing people from the flight, and there were too many carry-ons so they checked bags at the very end. She then sent the gate agent, who came at the end of the flight, with a list of the three to see who was missing. Two first class and 1 coach passengers were missing. Because there were missing passengers, she had to do upgrades. That was how a couple went to first class because she now had two seats and they went forward.

Ms. Miller stated that she did not have interaction with the flight crew after they went to the plane. She was dealing with PS0 travelers. She said the deadheading crew was the last she talked to because of their seat assignments.

When asked if she had to hand anything to the crew, she said the gate agent did that. She stated they had a final report with information on it and the captain got the top portion. The final report had information about “co-stars” and on time performance. She also stated that they did not have to do an accuload from their printer because they had one on board. She said she did not take the paperwork down to him.

She said the flight left 1 minute late. She said she had minimum ground time to turn it. When asked if the flight was considered late she said if the inbound was late it was just a couple minutes and was basically on time. She also stated that she worked it by herself for a long time until 2 other gate agents showed up to help her out. When her supervisor came around the corner, he was surprised that the flight was gone. She said flight 1404 pushed back at 1803 or 1804.

Ms. Miller was asked if she heard of any problems with the airplane. She stated that there were no problems with the airplane and she understood some of the things that were said. She said customers were coming to her from an Alaska gate from a Denver-Seattle-Anchorage flight and now they were on a CAL flight from Seattle to Anchorage. She said the Alaska flight had been delayed due to “incidents.” She stated that the passengers coming to her talked about mechanical problems with the Alaska flight. Ms. Miller knew she did not have a mechanical issue on her aircraft because they communicate pretty well with all that. She said even if it is a seat cushion, she knew if maintenance was on her aircraft.

She stated that the Alaska flight was delayed for 2 hours. She thinks passengers overheard people talking to her when checking in. She said the Alaska PA that announced the maintenance delay was loud and could be heard in her gate area, even when she was boarding. The sound echoed. The passengers who came to her were on Continental on the second leg of their trip. They were on United into Denver, Alaska to Seattle, then Continental to Anchorage.

She did not talk to the first officer much. When he came around her podium, she said the plane was there and he went through the door after she checked him off.

When asked about the captain's mood and demeanor, she said he was like she had seen him before. She said he was just a really quiet guy and that is probably why she talked and asked questions. She said she had seen him a lot. She said he seemed fine, just absolutely like she saw him two months ago. She said he seemed in good health, was alert, and friendly.

When asked about the first class split upgrade, she said they had a couple in coach and she asked if one of them wanted to go to first class and one stay in coach. They said they did not want to split. Later, the couple moved to first class because of the two no shows.

Ms. Miller was asked how long she knew the accident captain. She only remembered the captain coming to DEN in the last year. She said she did not know him personally and saw him maybe 6 times in the year. She said she worked a lot.

Ms. Miller was asked if she saw the accident crew interact. She said she saw them speak briefly behind the podium and they were professional. She said it was a routine interaction and she had seen a lot of them.

When asked if she heard any discussion of weather, she said not during a conversation, but she knew what the weather was because she was a load planner, too. She said after the flight left, she was a load planner that night. She was asked if she remembered the winds but she could not say. When asked if she remembered them being unusual she said no, probably a little higher than usual. She said a little gustier but nothing else, and the temperature was pretty cold.

When asked if she heard any other flight crews before or after flight 1404 talk about the weather or have concerns, she said, no. She said that included the deadheading crew who stood there for a long time at the podium.

She did not do the load plan for that flight.

She said the flight crew was not rushed and they had plenty of time.

Interview:	Beverly Dienes, Continental Airlines, Operations Coordinator
Represented By:	Daniel G. Orfield, ALPA Legal
Date:	December 23, 2008
Time:	1552 MST
Location:	Marriott Gateway Park Hotel, Denver, Colorado
Present:	Operations/Human Performance Group

During the interview, Ms. Dienes stated the following information:

She was the operations coordinator for flight 1404.

She only interacted with the captain when he came down to get his paperwork. He asked where the vending machines were. She directed him to them at the back of the building. After that he just looked at his paperwork.

Asked whether the captain made any changes to the paperwork for the flight, Ms. Dienes said that the pilots sign the operations coordinator's copy and keep a copy for themselves. He had signed her copy. There were no changes made to the paperwork.

Asked whether she knew the captain, Ms. Dienes said she had only been in Denver for about a month and a half. Other than meeting him the night of the accident, she did not know him.

Ms. Dienes had been with CAL for 22+ years. She had been based in Portland, Oregon before transferring to Denver.

Asked whether she had had any other interaction with the captain, Ms. Dienes said she had just asked if he would be headed home for the holidays and she had wished him a Merry Christmas.

Asked how the captain looked when she saw him, Ms. Dienes said he looked fine, like he was ready to go home at the end of the day and ready to go home for the holidays. He was nice.

Ms. Dienes' function as an operations coordinator was to help set up the paperwork for the flight. She would pull off the paperwork, figure out what freight, mail, and commodities would go on the airplane. She input the baggage numbers from the ramp and generated the flight manifest and load plan. It was computer generated. She would input the data in the computer and it would be sent to Houston and be sent back to her.

Asked to describe the captain's mood, she said it seemed like he was ready to go home. Asked whether he appeared to be in a hurry, she said no, that he was just pretty calm and matter of fact. He did what he had to do and was headed back out to his airplane.

Asked whether she got involved with weather information, she said no, it was just what was on the paperwork.

Ms. Dienes was only working flight 1404 as the flight was being prepared for departure. She only had one flight at that time. They had handled a flight about every 1.5 to 2 hours that day.

Asked if she had heard any of the pilots mentioning anything about weather, she said she had heard an update from the command center that there were going to be high winds on the runways and they had been asked to secure all the ramp areas and jetways because they were expecting 35 knot winds. The city command center had provided the information. Her office had a briefing phone. The same information was given out all around the airport. They would provide an update now and then, such as de-icing issues. She called it the red phone. Asked to clarify what was meant by securing the jetways, Ms. Dienes said they were to make sure the doors were closed, and that nothing was loose that could cause debris problems.

Ms. Dienes was asked whether she had observed what the captain had to eat. She stated that he had walked back to the machines, but she had not seen what he had purchased. She had not seen him eat anything.

Asked to characterize the captain's level of alertness, she stated that he seemed alert.

Ms. Dienes was asked whether, in her experience, 35 knot winds were unusual at the airport. She stated that it was "Pretty odd." It seemed like a high number to her. She had not seen winds that high since she started working at the Denver Airport. Asked whether she heard any pilots discussing the winds, she said no.

Ms. Dienes said she had not seen the accident captain before that night. He did not seem rushed.

Asked how long the captain had stayed in her work area, she said, "Maybe ten minutes at the most." He had walked back to the vending machines, then spent 5-7 minutes on his paperwork and had then left. Asked whether that was a pretty average amount of time, she said yes. He had a short flight to IAH, so there was not a lot to look over.

Asked to confirm whether there were any changes to the paperwork after he reviewed it, she said no.

Interview:	Clifford Pittman, Continental Airlines, B-737 Fleet Manager
Represented By:	N/A
Date:	January 27, 2009
Time:	1420 CST
Location:	Continental Airlines Training Center, Houston, Texas
Present:	Operations/Human Performance Group

During the interview, Mr. Pittman stated the following:

He had been a fleet manager for 5 years and with Continental Airlines for 30 years. He had about 12,000 hours of total flight experience and about 4,000 hours in the B-737. Captain Pittman joined the Marines Corps in 1971. He flew A4s for 7 years and was in two tactical gun squadrons. He then trained pilots in TA4s at Kingsville, TX. In 1978 he was hired by Continental Airlines. After 2 years, he was furloughed on November 1. He spent four years on furlough and during that time he ran his own business. He came back to Continental Airlines and spent 10 years on the B-727 and 10-12 years on the B-737.

As a fleet manager, Captain Pittman was responsible for training, the flight manual procedures, the interaction with vendors and with Boeing on the B-737, and the operational and procedural references to the B-737. He said no one else did that but he had some people work for him and assist him with it. He said Continental Airlines at one time had 70 instructors but at the time of the interview had 40 instructors, plus 11 ground instructors. Captain Pittman said he was also responsible for interacting with check airmen on the line and provided annual qualification. He stated he did more of the procedural aspects and Captain Robeson did more of the oversight.

When asked about how Continental Airlines trained for crosswinds and the limitations Continental Airlines used, Captain Pittman stated that overall Continental Airlines trained the crosswind aspects of the airplane. He said the flight manual addressed it and what procedures were applicable. He said they had not varied much since he had been with Continental Airlines. He said Continental Airlines also took Boeing's guidance and applied it in their manual. He said they did not have limitations but rather recommended demonstrated guidelines that they had gotten from their documentation and put them out as demonstrated crosswinds. He said there was a crosswind limitation for autoland of 15 knots. He said unlike other aircraft with tracking systems, Continental Airlines did not have them.

Captain Pittman was asked if there was any other guidance or suggestions provided to pilots regarding crosswinds. He said they basically provided the same documentation that they got. He said they tried to follow Boeing documentation they had, digested it, and put that in a context in their flight manual. He said the recommendation was that they were recommended crosswind limits. He said that pilots had to make a judgment in a crosswind situation for landing or takeoff but it was the guidelines from that perspective. He said they had some sort of crosswind in most of

their training and had a particular flight simulation 5 that had a 25 knot crosswind. He said it was in ABQ at altitude. He said the transition was included in the full flight simulation 3, which was used as a part of AQP [Advanced Qualification Program].

Captain Pittman said that in 2004 or 2005, Continental Airlines did a 35 knot crosswind in the annual maneuvers validation to lay a baseline. He said everyone who did a transition got it, and said it was for both takeoff and landing.

When asked what the limit in the manual was, he said it was 33 knots. He said it was based on 40 knots and they downgraded it to the lowest crosswind of all aircraft. He said there was a reason that they had it at 33 knots.

Captain Pittman was asked if the winglets were from STC [Supplemental Type Certificate] and he said yes, it was an STC from their partners. When asked to clarify the 22 knot crosswind with winglets, he said that was in the general section and there were no limitations. He said the STC said there were no additional limitations outside the aircraft. He said it was a demonstrated limit and did not apply to a dry runway. He said on a wet runway, the limit was 23, and it was applied across the fleet. He said for a dry runway, there was still no limit other than the airplane limitation and it was pretty precise. He said it was in the performance section, not the procedures section, which is where they expected to see the operational application. He said the performance section was performance and they were looking for limits in procedures to be followed.

When asked if 24 knots was the certification criteria, he said yes.

He said for a long time, they asked questions because there was never a limitation and the indication was they were demonstrated because that was what they had and what Boeing was willing to give them. He said it did not create operational issues or concerns for them and that was why they reduced it from what they had.

When asked if he had heard about any problems in training or checking with crosswinds, Captain Pittman said he had no knowledge of any significant issues that they had had with crosswinds. He said there were a couple of incidents in the past but they were not related and were relatively explainable. He said there was no data issues from AQP, which they monitored to see if they had any issues with crosswinds. He said it was something in the range of 3-4 percent repeats when they had something. He said that was not unusual to have a particular error in training with engine outs or anything along those lines and to have repeats.

He said they did a review every month, a “safety change” and also a comprehensive review quarterly.

When asked if the B-737-500 had a manual or electric trim, he said it was electric. Captain Pittman was asked if he had ever heard of anyone putting in rudder trim while taxiing either on purpose or inadvertently from pressure on the tiller and he said never. He said the procedure for setting up rudder trim was to ensure it was at zero when receiving the aircraft. He said they checked for movement and ensured it was at zero. He said it was part of the flows on taxi out.

Captain Pittman was asked how often they practiced crosswind takeoffs in training at Continental Airlines. He said they practiced it in the MV and there was some crosswind trained every year. He said they were trying to ensure that pilots had proper control inputs. He said wind velocity was less of an issue and not as critical as knowing that they were able to track. He said if they were able to track then it was pretty consistent.

When asked about procedures taught for control inputs for crosswind takeoffs, he stated they told pilots to add slight forward pressure on the yoke, aileron into the wind to keep the wing from lifting up and rudder as appropriate to keep a straight track down the runway. When asked if they taught a preset aileron, he said they never really taught a specific preset aileron.

When asked if he had any objection to a pilot starting the takeoff roll with aileron in, he said they had never taught that because of the spoiler issue. He said he thought they put out a newsletter article that they did not encourage that type of approach with a swept wing airplane like this. Captain Pittman was asked to clarify the spoiler issue. He stated when a certain point was passed, it could extend the lift-off point because of a loss of lift on a particular wing. He said they rotated at 2.5 degrees per second. He said they were very conscious of tailstrikes and did not like to delay rotation or go above the pitch limit. He said nominal input on the rudder was needed to keep the aircraft on the runway. If there was a delay, he said pilots needed to slow their rate of rotation. He said the spoiler would extend the time on runway and they told pilots to not go above their pitch limit.

Captain Pittman was asked if he had experienced a situation requiring use of full rudder authority to maintain the centerline in the B-737-500. He said that would be pretty unusual and he did not think he had ever had to use full rudder authority on any aircraft. He said that rudder input was pretty nominal.

When asked what proportion of rudder he would typically use on a crosswind, he said it was a guess but not more than 20-25 percent unless there was a big gust or something. He said he had never gone to the full except when he did the taxi check.

When asked what the most crosswind component he had ever faced in a B-737, he said possibly up to the published guidelines. When asked if he was confident that he had gotten it to the limit, he said he had had some pretty strong crosswinds.

When asked to rate how difficult a takeoff with a 27 knot crosswind component would be, he said it was not significant at all and was well within the parameters. He said he would think about it but he would not say that it was a difficult maneuver and he would not be concerned about it. When asked to rate it on a scale of 1-10 he said it was a 4.

If winds were 31 knots, he would rate it as a 4.4 and said it was not that big of a difference. If winds were 37 knots, he said it would depend on whether the winds were gusting or not. He said if he could stay on track and he was comfortable, it would certainly create an awareness. When asked to rate winds at 31 knots, gusting to 37 he said it would be the “same story.”

When asked if he would ask for another runway, he said he would if he felt it was outside the demonstrated limits or crosswind guidelines as recommended. When asked specifically about a dry runway in the B-737-500, he said it was 33 knots. He said Boeing's guidance was 40 knots but Continental Airlines had changed theirs. When asked about if winds were 31, gusting to 37, he said he would consider switching runways at that point. He said there were operational consequences of reducing the wind velocity because they thought it was the safest approach. They wanted to be consistent across fleets.

Captain Pittman was asked about DEN and if he had any qualms about requesting an east-west runway if the operation was on the north-south runways. He said he did not think that operational decision was different at any other airport at any time. He said he wanted to operate within the limits and ATC may not be aware of the limits or operational needs.

Captain Pittman was asked to discuss the 2004/2005 emphasis area in MV that focused on crosswinds. He said in MV, they took crosswinds higher than they normally did. He said it was an emphasis area and everything they did was to focus on things that they thought crews needed to know or to highlight something outside of what was required in AQP. When asked if they had a greater retrain during that time, he said it was about 4 percent which was pretty normal for that sort of thing. He was not sure why they had that emphasis but said maybe it was because they had a tailstrike on the B-777 in that timeframe. He said they would see things across the industry that made them go "hmm" or they might have gotten information from the FAA. He said Boeing also put out changes in bulletins that may prompt it.

When asked how the crosswind emphasis area was different from normal MV, he said the velocity was different. He said they wanted to make sure that pilots understood the transition, how to track down the runway and wanted to watch aileron input into the wind and the shift from a crosswind controlled airplane to a level airplane as they took off. He said it was the same thing on landing when they touched down.

When asked at what point pilots transitioned from crosswind control to level airplane, he said once they lift off the ground and were clear of the ground, it was a smooth transition. He said they did not specify a time limit for how quickly after takeoff to do that. He said the main thing was to get tail clearance from the runway and a tailstrike was a big deal for the B-737. He said the maximum pitch on the B-737-500 was 14 degrees, but Continental Airlines used the more conservative pitch on the B-737-900 of 9 degrees. He said Continental Airlines did not want to change things per plane so they took the more conservative numbers, such as a 2 degrees/second, for the whole fleet using the most limiting airplane. He said if there was a wind gust, pilots should slow the pitch rate.

When asked if the handling of the B-737-500 was any different than bigger B-737s, he said it was the difference between "a sports car and a Cadillac" and was a small coupled airplane. He said it handled well but was short coupled so had faster, quicker rolls. He said the B-737-900 was more stable and tracked better. When asked if

there were differences with crosswinds, he said it was the same but the movements were “snappier.”

Captain Pittman was asked how often Continental Airlines offered CRM training. He said it was integrated throughout the training program, and pilots could bust CRM on any procedure because working as a part of the team was essential. He said they were doing it, talking about it, observing it, and debriefing it both in the building and outside the building. When asked if it was integrated through AQP, he said it was integrated throughout their training.

When asked if there was a standalone classroom training for CRM, he said yes. When asked if everyone got it at recurrent, he said yes. He said it was a part of their commitment and this year was “success LOSA.” [Line Observation Safety Audit] He said the company was committed on an annual basis to provide some input in addition to CBT [computer based training], classroom, MV or LOE. He believed it was something provided every year through classroom or CBT.

When asked if he had ever flown with the accident crew, he said he had not and did not know them personally. When asked if the accident crew ever came to his attention as far as performance went, he said no. He said Continental Airlines’ approach was to get people the proper training. He said the accident crew’s names never came to his attention.

When asked if Continental Airlines provided threat and error management training, he said yes, very heavily. When asked what was trained, he said threat and error management and the ability to communicate their CRM training. He said he could not stress how deep the culture was at Continental Airlines. He said when he came to Continental Airlines, pilots could only bust for criteria like if 5 knots off of an airspeed, but now if not communicating or interacting properly, that was just as good a failure as an active failure.

Captain Pittman was asked to clarify the recommended 33 knots and STC of 22 knots for winglets. He said the STC was talking about the performance section, the demonstrated crosswind limit of the aircraft. He said the second sentence said this did not apply to a dry runway and therefore they went back to the standard which was 40 knots but Continental Airlines reduced it to 33 knots.

When asked if he told pilots what the Boeing crosswind limits were based on, Captain Pittman stated that they were pretty close to the verbiage Boeing put in the flight crew training manual. When asked if he told pilots of the process of how the limits were done, he said he did not think they ever outlined what they were. He said they did not hide them but said it was demonstrated wind by Boeing pilots. When asked if he knew what they were based on, he said his basic understanding was that it was the winds available at the time. When it was clarified that he was being asked about guidelines rather than demonstrated, Captain Pittman asked that it be explained to him. It was stated that Boeing put out numbers, which Captain Pittman previously said were 40 knots, but Continental Airlines reduced to 33. Captain Pittman was asked if he knew what they were based on. He said probably not, although they probably did not hit the control stops. He said they put guidance in the manual for pilots to follow. When asked if

Continental Airlines pilots knew about the criteria for 75 percent not using the last 3rd of aileron and rudder travel in steady wind in the simulator, he said no.

Captain Pittman was asked if there was guidance on when the captain should come off the tiller when taking the runway. He said they did not recommend using the tiller above 20 knots, but said they were going to change that because they had some long taxiways. He said they were given permission to use it at IAH up to 30 knots, particularly since the longer runways were added, and it was more appropriate.

When asked if there were any techniques given to pilots by instructors or other materials if they were deviating from the centerline to use anything but rudder and aileron, he said no.

When asked if CRM training was a graded item, he said yes. When asked if CRM was a component for every grade, he said it was for a LOE checking event. When asked if a pilot could fail on CRM, he said yes.

When asked if a crosswind component was a required check off item for qualifications or signing a pilot off for the line, he said the operating experience worksheet had to be completed and that was a part of it.

Captain Pittman was asked what his expectation was of hand and feet position of the monitoring pilot once a pilot flying adjusted takeoff thrust, he said the monitoring pilot ensured that the throttles were properly adjusted and made sure those adjustments were made. He said when they got autothrottles, they changed that so they did not hurt any fingers. He said they did not have them follow the controls but just monitor them to make sure things were going correctly. He said there were no specific guidelines on where to put their feet.

When asked if they preached heels on the floor after thrust was set, he said they always taught heels on the floor. Particularly because they use RTO [Rejected Takeoff] setting on the autobrakes and they did not want people accidently kicking the autobrakes off.

Interview:	John Lumsden, Continental Airlines, B-737 Flight Instructor/ Aircrew Program Designee (APD)
Represented By:	N/A
Date:	January 27, 2009
Time:	0820 CST
Location:	Continental Airlines Training Center, Houston, Texas
Present:	Operations/Human Performance Group

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

Mr. Lumsden worked in flight standards and training for Continental Airlines under Captain Pittman. He had been a check airman on the B-737 since 1989. He had had various jobs “in and out of the building” and flew the line as well. He had been an APD for 6-8 continuous years. He said there was a minimum quarterly flight time requirement of 20 hours that they usually exceeded. He said he also did IOE (initial flight training from the simulator to the line) and was an instructor for a pilot’s first 2-3 legs before they handed them over to a LCA [Line Check Airman].

Mr. Lumsden said he was Navy trained and flew off a carrier, he was jet trained in S-3s. He flew for Continental in 1979 for a short time before he was furloughed and went back in the military. He was a Navy instructor in T-2s in Beeville, TX from 1980-1983. He then flew DC-9s in Jacksonville, FL, for six years as an instructor for the Navy, in and out of the reserves. He went back to Continental Airlines on the DC-9 from 1986-1988, then went to Washington, DC, and flew the B-737-300. After that he got hired in Houston and was checked out in the 200 and 100 because they were dual qualified as a flight instructor. He said he flew all of the B-737s but the 400 model. He held several jobs at Continental Airlines – he worked in management, as a line pilot and as a flight instructor. He did not know how many hours he had in the B-737, but said he had thousands of hours in the simulator and well over a thousand in the airplane. He had about 10-12000 hours of total time.

When asked what training checks he was authorized to do, he said all of them, including line checks, MV (the 121 equivalent of proficiency checks), LOE (the simulator annual check), and initial type rating rides. When asked if these were all done in house or by the FAA, he said they were all done in-house and he had not seen the FAA do one lately. He said they came every year and watched him, and his last one was three weeks ago.

Mr. Lumsden was asked if written records were kept during instruction. He stated if it was a syllabus ride, they had a training jacket that was not electronic but pen and paper. He said they would note progress and completion and items changed according to the syllabus on the grade sheet, and it was all documented from the first CBT to IOE. Mr. Lumsden said if it was a continuing qualification, they filled out two pieces of paper which would be turned in and he would not see them again. He said they data-mined

the grades and de-identified them for the AQP database. He said the Electronic Training Records (ETR) department kept track of those and he did not have access to it.

When asked if comments that were made along the way were kept, he said not to his knowledge.

Mr. Lumsden was asked how many checks he gave in a year. He said it was a two-day event and he generally worked 18 events, two of which involved flying and there were a couple of days for him to work on his projects, so he estimated that he did 12 checking events of some type per month. He stated that if they were training it would be less checking and more training, but right now it was almost all CQ work because Continental Airlines was not hiring and they were not doing much training. He said it was mostly seat–to-seat or transition to an airplane.

When asked if there were any areas commonly more difficult for pilots than others, he said what pilots had trouble with was what they did not get to do on the line. He said some of the things they emphasized was stuff that pilots did not get to do every day. He said the things pilots did on the line, they did well, and AQP could tell which areas were repeats. He said V1 cuts, single engine go-arounds, RTO, and non-precision approaches were more challenging. Mr. Lumsden said they would spend more time in the brief on those things because pilots were not exposed to them as often, not that they would not perform as well.

When asked how they train or check for crosswinds, particularly during takeoffs, he said it was in the syllabus. He said they had one ride where they do a 25 knot, 90 degree takeoff and landing. He thought it was in ABQ at high altitude with a strong crosswind for every takeoff and landing. He did not think they had any takeoff or landing in a CQ that did not have a crosswind. He said they always gave them a wind, it may not have been 90 degrees, but they always gave them a wind and it was “not nice.”

He said they were developing this year’s LOE and always used the instructors to help develop next year’s check ride. He said they were making an RNAV RNP [Area Navigation Required Navigation Performance] into Washington National, and it dropped them off in a turn on final to runway 19, with a right to left crosswind of 12 knots. He said a couple years ago, crosswind was one of their training proficiency items on MV, and they did a 35 knot crosswind, whereas the syllabus was 25 knots. He said it was not a graded item, but it was like windshear and CFIT – a demo after the ride was over. He thought it was a pretty good procedure and was pretty well received.

When asked if any specifics were trained on how to handle a 90 degree crosswind, he said his technique was to try and get pilots into the concept of “wings level, wings level, wings level”, and that it was going to take aileron input that was of a magnitude that they were not used to doing. He said when they did upset recovery training, pilots were uncomfortable and reluctant to move the controls enough so that they would “spill the drinks” because they were all about being smooth. He said they taught pilots to keep the wings level and to not worry about the control input to keep the wings level. He said when they rotated, if they kept the wings level, it did a nice job. He said they did not use cross-control to land but rather flew with a crab and then kicked it out to land, and emphasized keeping the wings level when kicking it out.

When asked if there was any guidance from Continental Airlines that he followed for his technique, he said he did not know. He said he knew the technique of crabbing for landing and cross control on takeoff were in the flight manual and might have been in the syllabus. He said it might have been his way of teaching the wings level part, and he was not sure where that came from.

Mr. Lumsden was asked if there were limits on how much crosswind Continental Airlines pilots can accept. He stated there were guidelines and recommendations but not limits. He said there were limits for autoland and contaminated runways. He said for dry runways, when hand flown, a pilot should assess his own ability. He said they were only guidelines that he was aware of.

When asked if the guidance was 33 knots for a dry runway, he said that was the number he knew.

When asked if he would takeoff if told winds were at 38 knots, he said there were a lot of factors that he would consider before he would decide if he was comfortable with that. He said he got a lot of cues from the world around him – are the winds swirling, was the flag straight, was the runway dry. He said he had to land in a lot more than that in snow in Keflavik Iceland and if he used the techniques it was okay, but he said there were no alternatives. He said it was certainly not something he would do without consideration and it would get his attention for sure. He said 35 used to be in the book somewhere but now it was 33.

In the case of DEN, Mr. Lumsden was asked if pilots are taught to request a different runway to operate into the wind. He asked “have you ever requested anything in EWR?” He said in hindsight it would have been prudent, but said pilots did not often question the departure-arrival pattern of the airport. He said they accepted a 10 knot tailwind in Houston all of the time because it kept the planes moving, and ATC would keep doing it until they could not do it anymore. He said DEN may have kept things moving a certain way for noise abatement, a pilot might not have thought it was the best thing. He said pilots generally liked the wind “on their nose.”

When asked if instructors provided input for procedural and training changes annually, he said all instructors have input and they did an instructor evaluator course (an instructor check ride). He said it was next year’s profile done in a group. He said they got the profile, got to fly it, brief it and debrief it, and then gave input on what was valid or not valid, whether the difficulty level was right, how the weather should be, etc. He said instructors got input in the continuing qualification. He said there was another flight instructor in charge of the syllabus and he requested input on that if he thought something was not working. He said an approach may be decommissioned somewhere around the country and it required that their syllabus be adjusted. He said the content was the “standards guys.”

Mr. Lumsden was asked how he felt the fidelity of the simulator compared to the airplane. He said all of them flew pretty well. He said when they talked about did they fly well, the oldest “round dial” probably flew the most like the real airplane. He said the proof was if a line pilot could come in the simulator and had not flown in a simulator in

the last year and could land it smoothly, then it must fly pretty close to what was on the line. He said he did not hear that it did not fly like the airplane.

When asked about the crosswind fidelity in the simulator, he said he knew they could do a crosswind with gusts and it could be felt. He said it felt right to him but it was hard to find that kind of a crosswind in real life, so it was hard to compare without an airplane experience. He said for the lighter crosswind, it was very accurate – it drifted and the nose moved. He said when they rolled and did not compensate for the crosswind, “it eats their lunch.” He said that was part of the downside of the simulator – it was not completely full motion or seat of the pants – it was partly visual and in the simulator there were no ground cues.

When asked if the 25 knot crosswind was only given in initial qualification, he said it was in the syllabus in the initial qualification and in recurrent training. 2-3 years ago they gave a 35 knot crosswind as a train-to-proficiency item. It was not done every year but they picked something every year. When asked how it was taught, he said it was a training-to-proficiency item at the end of LOE or MV depending on timing. He said there were 2-3 items – a 35 knot crosswind takeoff, a 35 knot crosswind landing and proper use of thrust reversers on landing. He said everyone had to do it but it was not graded. He said everything below-the-line of the form was not graded. It was part of the brief for the MV because it was not going to be an item. He said he would probably hit it a little harder because it was one of those things that they did not practice very often. He said they were not going to get a 35 knot crosswind often so they made sure they knew to keep “wings level” during the brief. He said most pilots did really well with that.

Mr. Lumsden was asked if anything was different about how he briefed a 35 knot crosswind compared to a 25 knot crosswind. He said it was more of the same, but it was not in the syllabus because they were not as experienced with the airplane. He said he taught them techniques and wanted them to be successful. He said these guys were experienced pilots so they wanted to give them more of a challenge. If they did not do well, they just had to do it again.

When asked what the most common mistakes were, he said not keeping the wings level. He said if they needed some encouragement, he would tell them do not forget to keep the wings level. He did not see anybody depart the runway but did see them catch a wingtip or two if they made a mistake. When asked how many pilots were put through that scenario, he said he did not have clue, but it was a year’s worth, so he maybe did 60 himself, and there were 70 instructors.

Mr. Lumsden was asked what would happen if a pilot did not keep the wings level. He said if in a landing configuration and touched down, it would go flaps, engine, wing tip. He said if they really did it hard in the simulator, it will crash and freeze. He said he did not really remember as it was a long time ago but it would tell him if they hit a wing tip. He said if they made a mistake either he did not like the bank angle or they hit something. He could not say what percentage had to repeat but it was not 100 percent.

When asked how often he saw pilots use full rudder when dealing with a crosswind, he said he was not able to evaluate that because he did not have a display,

and if he did have a display, he did not watch it by displacement. He said he judged by position and assumed whatever they did was correct.

He said he had never used maximum rudder authority when dealing with a crosswind.

When asked what proportion of rudder was used, he said it was not a fair question and could not give a real good answer. He said a B-737-800 handled different than a B-737-500 which handled different than a B-737-700. He said the difference from the rudder to the center of gravity differed, rudder effectiveness differed, position of wings differed. He said the nose on the centerline, whatever it takes and it took differing amounts for different airplanes.

When asked how a B-737-500 series compared to other B-737s in a crosswind, he said he did not know if he would notice a difference between a B-737-300 and a B-737-500. He said longer airplanes in a B-737-700 wing seemed to be, stable was not the right word, but it took more piloting for the classics than the new generation airplane. He said the B-737-800 and B-737-900 were harder to move around because of more mass. He said a Mack truck did not get moved around like a Miata did. He said there was no less ability to control the airplane, but it required a slightly different technique.

When asked if there was a difference with winglets, he said not for him and he could not tell the difference. He said some guys said they landed a little differently, but said his skill level was not sufficient to be able to know the difference. He said he had to look at the speed brakes to see if there was a 50 percent speed detent. When they were putting them on, he said he could not tell the difference, but FOQA [Flight Operational Quality Assurance] said they saved them some gas.

Mr. Lumsden was asked what he taught in terms of setting up the rudder trim for takeoff. He said it was “zero” and it was on the checklist. He said after the USAir accident, they made the dial round to make sure they could not put their foot on it from the jumpseat and it was on the before start checklist. He said it was not possible to change it without power on the airplane. He said the rudder could move and the dial could move because they were not hooked together, but it was pretty unlikely. He was trying to remember if it moved the pedals and he thought it did.

When asked how big the crosswind was in Keflavik, he said he did not remember but thought it was 25-30 knots direct crosswind.

When asked to rate the difficulty of a 27 knot direct crosswind on a dry runway at night, he said it was tougher at night on landing because there was no horizon but on takeoff it was probably a 6 or a 7.

When asked to rate the difficulty of a 31 knot crosswind, he said he did not know that he would know much difference. He said once it was around 20+ knots, the technique and challenge did not change much. He said it was the same difficulty.

When asked about a crosswind of 31 knots, gusting to 37 knots, he said that was kind of tough. On a scale of 1-10, he said he would have to see if he would takeoff and

the answer was probably. He said it was kind of a viable option in the absence of any other abnormality. He said he certainly would run through a brief with the copilot on the technique and review. He said he would rate it as an 8. He would not say it was not a problem but would probably take off and he would get a feel for it on taxi as well.

Mr. Lumsden was asked what it would take at DEN to request a different runway. He said if all traffic was going north, he probably would not ask. He said he did not know what the number was that would make him ask for another runway. He said DEN was a huge and modern airport so he would put some credence in the winds that he was given. He said at other airports the winds would not be the same as reported where they were taking off and he would assume that other pilots would comment if it was not good. He said they would report to ATC if they got a gust here or there. He said seeing guys take off on a runway in front of him would give him some confidence that it was a doable takeoff because other pilots were not complaining.

When asked when he would take out the cross controls on takeoff with a crosswind, he said a pilot should consider a full power takeoff, should not under rotate, and the danger there was from rotation to where the airplane could get away from the ground and where angle of bank did not endanger the airplane. He said he would want a good acceleration and rotation rate and when he got off the ground he would need to correct it.

He said he did not know who the accident crew was and neither name “rang a bell.”

Mr. Lumsden was asked about guidance for when the captain should stop using the tiller during the takeoff roll. He said he did not believe the captain should ever use the tiller on the takeoff roll. He said he believed the guidance in the flight manual was that one should not use it. He said he would teach a new captain to not use the tiller on the takeoff roll.

When asked if he was having difficulty maintaining the centerline, if he taught any technique to maintain it other than aileron or rudder, he said no. He said forward pressure and rudder input had always been sufficient for him to maintain the centerline. He said the only other thing would be differential thrust or braking but those were not an option on takeoff.

When asked about Continental Airlines’ failure rate for MV and checks, he said the managers did that. He said his particular failure rate was for “unsat” maybe 1-2 per year. He said MV was a train-to-proficiency and they got two days to do one day’s worth of work. He said not many pilots used the two days. He said they had a short cycle program where if a pilot did okay but not as good as others, he could come back in a shorter time period to train again. He said with the level of expertise, it was rare for crews to fail.

Mr. Lumsden was asked if he ever caught pilots going for the tiller a little early on landing during IOE and if he critiqued them on it. He said, “yes, not never, but not a huge amount either.” He said they had an 80 knot call and most of the time pilots did not do anything until 80 knots. He said it was rare for anyone to grab the tiller before 80

knots. He said when he landed, he still had the airplane. He did not remember anything above 80 knots, but he saw once they left the runway that a pilot may do it a little early.

He said his last company line check was a year and four months ago. His last APD check was this month, January 2, 2009. When asked about his separate line check in the last two years, he said because he was an APD he got renewed every year and that counted for both his APD and line check airman ride.

He said they did not have a formal QA department. He said the guys who had come in and had not been scheduled, the APDs would come in and listen to the briefs. He said it was just not formalized or signed.

When asked if he recalled training for a strong crosswind, train to proficiency, he said yes. He said the only difference was the grading issue. He said it was not a performance issue, but they had to do it like CFIT, windshear or upset training. He said it was not graded and counted but it was done with a check mark and pilots still had to meet proficiency. It did not go in a repeat count for a short cycle.

Mr. Lumsden was asked what he would do if he were the first aircraft taxiing out in DEN and was given winds 25 knots gusting to 40 He said he would discuss it with "the guy in the other seat." He would look at his experience level and comfort level. He said there were many things to think about – if the runway was wet or there was blowing snow, he would not go. He said he would go through all of the risk analysis. He said he was not totally sure and did not like someone not going before him. He said that was a comfort zone, and if 25 guys just did it, that he would not be as concerned. He said if he was the first guy, he would not like it. He said he would like to think that he would ask for another runway but was not sure.

When asked to clarify CQ, he said they were AQP so they had a qualification syllabus (initial) and CQ (continuing qualification) or LOFT. He said a new guy went through Q and then graduated in to CQ, which was a three year cycle. He said it was an AQP difference from Part 121.

When asked about winglets and speed brakes, he said they bought airplanes without winglets and put them on. He said the wing was not built to handle the forces at maximum airspeed, maximum load. He said at speed, they would not deploy the speed brakes fully on the retrofitted airplanes. They were limited to 50 percent. On the older airplanes they put a sticker there to indicate not to do that. He said airplanes delivered with winglets did not have that.

He said the qualification syllabus was Q. He said it was ground school, flight simulation, IOE, line check and then pilots would go to the continuing qualification syllabus. He said CQ started the day a pilot got signed off from the line check – the simulator check started the clock ticking. He said once a pilot completed the qualification syllabus, the pilot became a "CQ guy."

Interview:	Jeffrey Bradford, Continental Airlines, Flight Instructor, Simulator Check Airman B-737
Represented By:	N/A
Date:	January 28, 2009
Time:	0825 CST
Location:	Continental Airlines Training Center
Present:	Operations/Human Performance Group

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

He administered First Officer Levang's MV and LOE in early December 2008.

His official position was flight instructor and simulator check airman. He was a line check airman, but not an APD. He was a line pilot for his first 16 or 17 years at Continental and had been working at the training center for almost four years. He had a total of 22 years with the company and was hired in March 1987. He currently flew the line a minimum of 2 days per month. He also gave Quito checkouts and "special quals" down there, and did a bit of IOE as well, so he flew the line a bit more than the average instructor. His total flight experience was about 16,000 hours and he had about 3,000 hours on the B-737 as a captain. All his time on the B-737 was as captain.

Mr. Bradford was asked what MV and LOE entailed. He said MV was a series of maneuvers that they were held accountable for. He said they started at LAX [Los Angeles International Airport] on runway 24R with a 10 knot crosswind. On takeoff they would have a gear abnormal and have to clear that up. Then they flew to LGB [Long Beach Airport (Daugherty Field)] to do a total of four approaches. They also did Long Beach RNAV RNP approaches. He said the first one was a crew effort with him instructing. They would break out, he would make them go missed approach, turn the automation off, and make them hand fly. Then he would have them go around, hold, and set up for the opposite runway RNAV RNP approach down to a 14 knot crosswind on a short runway at LGB. Next, they would fly back to LAX for a 500 RVR low visibility RTO. They would go back to the end of the runway and do a low visibility takeoff 500 RVR. Then they would reposition the simulator, and do another low-visibility approach to a Cat III autoland approach. If he did not see the runway, they would go around and come back for another approach. The captain did an autoland at minimums on a Cat II approach. They would do a V_1 cut, fly around minimums and give them a single engine ILS missed approach. They would go back to final, and he would clear up the weather, fail the glideslope and localizer, and have them perform a single engine landing.

He said they did CFIT and windshear training also, normally after LOE because there was not enough time to get to it. He said the emphasis was on callouts and procedures – responding to callouts, and monitoring. He said they did not have a chance to carry out an entire LOE profile, and it was more of a series of flying the airplane and going through all the procedures. He said it was similar to the old proficiency checks.

He said the second day was LOE and that was scheduled as a line check. They would start in SFO with low weather, 400 foot overcast, cold, and just enough visibility to cross the threshold. He said they would taxi out and take off on runway 1 and did a gear abnormal. He said they had to manage that all the way down to return to SFO, if that was their choice, and land from that. He said maintenance would fix the landing gear and they would do another attempt at IAH. Enroute there would be a series of scenarios that required them to divert to Long Beach. He said there would not be an abnormal on the aircraft but a change in destination that required a lot of coordination. The crew would fly the RNAV RNP, go into LGB and would have to deal with icing on the way in.

He was asked if he recalled the check he did with First Officer Levang. He said the name sounded familiar. He had looked back on his schedules and saw he had checked First Officer Levang in December 2008. He looked up his picture and remembered him. He said the people who stood out were the ones who were fantastic or those that had difficulty and needed to be retrained (they had to fill out extra paperwork and follow up in those cases). He said Mr. Levang did not stick in his mind as having difficulty, but Mr. Bradford recalled having a favorable impression of him. He did not think First Officer Levang had to repeat anything. He recalled having a bit more favorable opinion of First Officer Levang than the captain he was paired with during the check. He thought it was more a personality thing with the captain because it was a little more obvious that the captain did not want to have to come in and deal with the training. He clarified that he was not referring to the captain from the accident flight.

When asked if he kept any written records on those he checked, he said only for about a day. He had a clipboard and there was a small block where he could make notes on the LOE. He said the pilots were given a copy of the MV form to bring the next day in case the record got lost. He said the pilots could also look at it as they talked about it and refresh their memory. Mr. Bradford kept some notes on a blank page about performance during the MV LOE so he could review it with the crew. He said by the time he came in the next day he normally had thrown the page out and gotten a fresh one. He said the only time he kept anything for any length of time would be if he did a short cycle. He would keep the paperwork in case he needed the documentation to give to his bosses. This time that did not happen.

Mr. Bradford said he knew the captain, but they were not close friends. He had socialized with him in a group playing golf once and seen him at the golf course one or two times.

Mr. Bradford was asked how crosswinds got covered in the training process. Most of what Mr. Bradford did was an evaluation of how they handled the crosswind and that usually came into play on the first takeoff during MV LOE where they were given a small crosswind. He said it was more of an evaluation. He said the landing of the second RNAV RNP approach was a 14 knot crosswind. He said they would break out and the nose was cocked one way.

When asked whether the captains ask the first officers to input a little aileron on the ground, he said it was more of an evaluation and as far as training goes, he thought

airline pilots should know how to take off and land an airplane in a crosswind. The only time he would do a lot of crosswind evaluation was when they got new pilots, primary systems students, who were new hires or transitioning to the airplane from another type. He said in full flight simulator #3 there was a pretty strong crosswind in ABQ. He said there were a couple of strong crosswind takeoffs and a couple of strong crosswind landings. The briefing for #3 was a "quick down and dirty," asking about limitations, asking about their technique and doing a little evaluation and then providing pointers as they were flying the approach and landing during the lesson. He said that was where they really focused and looked at crosswind takeoffs.

Mr. Bradford was asked if CAL had a limitation on crosswinds. He said they had maximum demonstrated crosswinds listed in the limitations section and that would definitely be his limit.

When asked if there was an amount of crosswind that would prompt him to ask for a different runway, he said if he had a long dry concrete runway, he would go up to the maximum that was listed in the book. He would feel completely comfortable doing that, but would not want to go above it in case anything went wrong and would not want to have to explain it later. He said it was demonstrated and came from Boeing and it was a pretty good limit. He had not exceeded it and did not want to. He thought that would be the opinion of most CAL pilots. He thought people would probably err more on the side of caution. He said he had to be "on his game" to fly the airplane when it was that strong. He said if they had that kind of crosswind on runway 26 at IAH, with the wind coming across the buildings and everything, 33 knots would be more than he would want – he would expect turbulence and changes in airspeed.

When asked if he saw any particular problems with pilots and crosswinds at CAL, he said it was pretty much a non-event. He thought that it was very rare to have to repeat a crosswind takeoff or landing on ride number three. He said he could always provide a couple of pointers, but did not really see performance being unacceptable.

Asked if he thought CAL pilots felt comfortable asking for a runway contrary to the flow at DEN, he said he did not know. If he did not feel comfortable he was not going to do it. He had personally refused to fly through a line of weather when asked to do so by ATC near MIA.

Mr. Bradford was asked what scenarios were trained for rejected takeoffs. He said most of the time they failed an engine during high speed rejected takeoff practice. They gave them different scenarios, perhaps during full flight simulator #2 with autobrakes on and off, and a wet runway with autobrakes on and off. He said it was usually done with an engine failure. He said the simulator had a few limitations but that was normally how they trained it.

He said the winds during full flight simulator #3 were 25 knots, it was runway 18 and winds were 350 at 25.

When asked about aileron technique during the takeoff roll, he said it was forward pressure on the yoke and turn into the wind. When asked if the aileron was preset or added later, he said everyone was a little bit different on how they did it. He

said most of the time they start off with aileron before they start moving down the runway, and other times about the time the power was starting to come up. He usually would not say anything. He said the difference was a matter of seconds and it had no effect between those two conditions.

He said they trained pilots not to use the tiller after line up.

When asked to rate how difficult a 27 knot direct crosswind would be on a scale of 1-10, he said it would depend on the runway conditions but on a dry runway with clear weather if a normal takeoff was a one, then that would be a three.

Asked if he could imagine a scenario when he would want to perform a rejected takeoff due to directional control with no engine failure, he said if he was rolling down the runway and could not keep the airplane responding to the inputs he was putting in, he would not feel comfortable taking that airplane into the air.

Mr. Bradford was asked if he noticed any difference between B-737-500s and other B-737s in crosswinds. He said the B-737-500 was a shorter coupled airplane so it reacted a little different than the “800s and 900s” on the ground. He said it was a slight difference and had a completely different feel. When asked about differences in the B-737-500 with winglets versus no winglets, he said he had heard different things but he could not tell that big of a difference. He said he might be able to tell under certain conditions, but not any major difference at all.

Mr. Bradford was asked to clarify if the first officer would grab the yoke as the captain went to the tiller. He said occasionally, the captain would ask the first officer to hold the aileron into the wind for him when they were not quite yet steering with the tiller. Mr. Bradford did not choose to do that because he felt comfortable holding it in himself. He would even clear on a high speed without touching the tiller sometimes. He said he did not use it until he was off the high speed. He said on a reject he was not using the tiller but was using his feet. He said he had seen some people hold the aileron into the wind when executing an RTO, but he sees variations in technique.

Asked if it would make any difference if the crosswind was gusting above the limit but the steady wind was below the limit (for example, 27 gusting to 40), he said he would not take that.

Interview:	Joseph Skaptason, Continental Airlines, Check Airman B-737
Represented By:	N/A
Date:	January 28, 2009
Time:	0915 CST
Location:	Continental Airlines Training Center
Present:	Operations/Human Performance Group

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

His position at Continental Airlines was flight instructor in the training department. He was a line check airman and proficiency check airman as well. He had been a line pilot for Continental Airlines for many years. He had been at the training center for 3.5 years, since April 2005. He had worked for Continental Airlines for 22 years. He reported to Cliff Pittman, the B-737 fleet manager. His total time was around 8,800 hours. He had about 3,000 hours as a first officer on the B-737 and about 1,500 hours as a captain.

In October 2008 he had provided training to the accident captain. He learned this when his boss had said the NTSB wanted to talk to him. He looked at the captain's picture on the internet and had the feeling he had probably met him before, but he did not remember any details. He had performed a maneuvers validation and an LOE with the captain, according to company records. He had looked up the first officer as well, but his picture did not look familiar. Mr. Skaptason performed 14 or 15 simulator events per month.

Asked whether he knew the accident captain personally, Mr. Skaptason said no, he was sure he had not seen him other than at the simulator events. He did not know the accident first officer at all.

Mr. Skaptason was asked how he instructed crosswind takeoffs and landings. He stated that during the MV and LOE, the two events he was teaching, every takeoff and every landing was performed with some sort of a crosswind, including the rejected takeoff. The wind was 15G18 in the LOE, which was somewhat minor compared to the accident. Mr. Skaptason got an opportunity to see how everyone did in that scenario. When pilots were new to the B-737, they were exposed to a 25 knot direct crosswind during takeoff and landing. He also saw them do a takeoff CFIT recovery and landing.

Mr. Skaptason had not observed any particular difficulty with pilot performance during crosswind maneuvers. The pilots who were brand new to the airline and the airplane had some difficulty. The takeoffs were not difficult for them, but the approaches and landings were. They would touch down long and off the centerline. It did not take too much practice for them to land on the centerline though. A lot of pilots, during rotation, if they did not have the aileron correction in during the takeoff, would find that the upwind wing would rise a bit, but they usually corrected pretty quickly.

Asked how he instructed or checked pilots during a rejected takeoff, Mr. Skaptason said they performed a “low viz 500 RVR.” Their visual cues were really hampered during the scenario. They were at a heavy weight, with the bleeds off for takeoff. They needed all the thrust they could get, and it was a very warm day (25 deg C). The two pilots would brief, then start stationary on the end of the runway. He would fail the engine after 100 knots, usually at 110 knots, then they would go through the RTO. They would stay on the runway, make appropriate callouts, and go through the RTO checklist. The captain engaged with either simulated ATC or fire rescue approaching the airplane. The captain then managed everything that needed to get done to get the airplane safely off the runway or to keep it parked.

Asked whether pilots were checked on RTOs involving difficulties with directional control, Mr. Skaptason said that on initial training there was a sim ride (#2) where pilots had three rejected takeoffs. The first one was due to a microburst warning from the tower. The first officer performed that and then the tower issued the microburst warning before the captain took control of the throttles. This required the first officer to do a low speed rejected takeoff. The other two RTOs were based on an engine failure.

Asked to describe B-737 crosswind limitations at Continental Airlines, Mr. Skaptason said there were some in the limitations section. It had some guidelines. They were not called maximum crosswind limits, they were called recommended crosswind component guidelines. He assumed the test pilots at Boeing had been subjected to a lot more than what Continental Airlines’ manual pointed out. They were guidelines. It was something that the Boeing pilots were able to demonstrate, staying on the centerline, based on the conditions of the runway.

Asked whether he would have a problem exceeding the guidelines, Mr. Skaptason said he would try to stick with the guideline in the manual because after that he did not really know what would happen. There was a paragraph in the limitations section that said the guidelines should be based on the captain’s experience and personal comfort with the weather conditions, and on the runway conditions.

Years ago on the B-727, Mr. Skaptason was confronted with a strong crosswind in OKC. The last 50 feet down, he was really surprised by how gusty it got at the last minute. They got it down quickly and no one got hurt, nor was the airplane damaged, but it was surprising.

Asked whether the dry runway guideline was 33 knots, Mr. Skaptason said, yes. Asked whether the limitation applied to steady state wind or gusts, Mr. Skaptason said it applied to both. He doubted one would ever get a steady state wind that high. In his experience, it was always gusty when the wind velocity was over 15 or 20 knots.

Asked whether he would choose to take off on a dry runway if he was faced with a crosswind of 25 gusting to 40 knots, Mr. Skaptason said that if he heard 40 knots, he was pretty sure he would not, adding he would certainly request a better runway.

Mr. Skaptason was asked if he would expect to encounter any problems requesting a runway different from the active runways at a major airport because of a heavy crosswind. He said no. He thought ATC might say it would result in a significant

delay, and if that was the case, he would ask where he could go shut his engines down. Asked if he ever had, in fact, asked for a different runway that went against the flow at a big airport, he said he could not remember if he had. It did not happen often if it had happened at all. He had requested the full length at EWR.

When asked if Continental Airlines trained pilots to pre-set the aileron during the takeoff roll, Mr. Skaptason said they train them to put some aileron into the wind right from the start, but discouraged full aileron deflection or rapid abrupt control changes during takeoff. That was addressed during initial training. MV and LOE was recurrent training, so they did not go into much detail about that issue. If he saw a problem with a pilot's performance, he would address that in the simulator, however.

Asked whether he could recall ever having to use full rudder correction during a crosswind takeoff, Mr. Skaptason said no.

Asked to describe the difficulty of a crosswind takeoff on a dry runway with a direct crosswind of 27 knots, Mr. Skaptason said he had never found it difficult, but it was not easy. It was demanding. One had to be prepared for it. It was moderate difficulty he guessed. On a scale of 1 to 10 with one being very easy and 10 being very difficult, it was probably a 6 or a 7.

Asked to describe the difficulty of a takeoff with a 31 knot direct crosswind, Mr. Skaptason said he was not sure how he would characterize it. The few times he had been confronted with heavy crosswinds it had never been that high, and they did not train for more than 25 knots in the simulator.

Asked whether he had noticed any difference between the performance of B-737-500s with winglets versus those without, Mr. Skaptason said no, but the B-737-800 and B-737-900 seemed more stable than the B-737-500, which seemed more "squirrely."

Mr. Skaptason was not an instructor during the 2004-2005 CQ MV period.

Interview:	Gabriel Vaisiman, Continental Airlines, Line Check Airman B-737
Represented By:	Daniel G. Orfield, ALPA Legal
Date:	January 28, 2009
Time:	1105 CST
Location:	Continental Airlines Training Center
Present:	Operations/Human Performance Group

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

He was a B-737 captain and line check airman. He was authorized to perform annual captain line checks, IOEs for new First officers and captain upgrades, special airport check outs, and occasional special line checks when a pilot was on the short cycle. He had been a check airman for 11 years and had been with Continental Airlines for 24 years, 25 years in July 2009. He had a total time of 25,000 hours, 14000 hours of which were in the B-737. He flew in both seats of the B-737, as a first officer for four years and then as a captain since 1997.

Captain Vaisman gave a line check to Captain Butler on April 14, 2008. He said as a check airman, he only remembered the super good and super bad pilots, and Captain Butler was neither. He said he might remember Captain Butler because he thought it might have been a trip to Guatemala, but he was not sure it was with Captain Butler. He said nothing stood out with Captain Butler in particular. He said if it was the Guatemala flight, it was a line check, and it was a normal flight.

Captain Vaisman did not know Captain Butler or First Officer Levang personally. He said he had heard First Officer Levang's name and pulled up his picture after the accident but did not know him.

When asked if he instructed on a regular basis, he said he had been involved in training for about the last 7 years during training cycles but the company just started furloughing.

When he lined up on the runway and handed the airplane to the first officer he said he would look at the wind sock and would tell the first officer if they had a crosswind and from which direction. He said there were procedures such as the rolling takeoff rather than from a full stop, if there was an extremely strong crosswind, use maximum thrust rather than reduced thrust, make sure a pilot got the wing into the wind and as airspeed was gained and a pilot began to rotate, he would need to see which way the nose was going and let some of it out. Asked whether they were trained to pre-set aileron, he said it depended on how strong the wind was. You want to get the correction in early and slowly let some of it out.

When asked if pilots had difficulty with crosswinds, he said more on landings than on takeoffs.

Asked whether they had a limit for crosswinds, he said it was 33 knots for a dry runway. Asked whether that was a limit or recommended, he said it was in the limitations of the flight manual – 25 knots for a wet runway, 21 knots for snow, and 16 knots for slush. He said they had limitations. Asked whether that applied to steady state or gusts, he said it was their maximum demonstrated crosswind, what the FAA had certified for their procedures in their flight manual. When asked if it was gusting to 40 if the limitation would apply he said it was the steady state wind level that the guideline applied to, but windshear, Doppler, weather conditions all factored in and it was the captain's decision. Going into Denver, it was an open prairie area and he had experienced the "where'd that come from", a big kick. He said it was probably one of the airports that was high jeopardy when it was windy. That could occur on takeoff or landing. He said he always had a surprise when it was windy.

Asked if he would feel comfortable asking for another runway if it contradicted the airport's flow, he said he personally did not have a problem with his ego and would rather be embarrassed by his peers than sit in front of the NTSB. When asked if there was any number that would trigger him to ask for another runway, he said it would depend on the captain's experience and comfort level. He said his comfort level was greater now than it was when he was a new captain. He taught pilots, especially in the first six months, not to be a hero and to try to save the company money, but to do what was right. He said a 90-degree crosswind would definitely trigger a request for him to change for any wind over 25 knots. It would cause him to think about it. He said that was his own personal limitation and what he thought he was capable of. When asked how other pilots would feel, he said it would be based on what they felt they were capable of – some more, some less.

Captain Vaisman was asked what he taught as far as rejected takeoffs. He said below 100 knots he would evaluate what the condition was and above 100 knots he would reject for a confirmed power loss, microburst alert or windshear. He said above 100 knots it was the captain's discretion, but below he would abort for windshear alert, especially for loss of airspeed. His procedure would be power to idle, autothrottles off, reversers, and make sure speed brakes were deployed.

When asked about training or checking for directional control, he said if he was unable to control the airplane, that would be an abort-able item. He said once he was transporting a cowboy in a Cessna 172 whose boot got caught beneath a rudder pedal and they almost went off the side of the runway, but his boot got loose and he was able to salvage the takeoff.

Captain Vaisman was asked about the surprising kick in an open prairie area that he mentioned previously. He said it was like a big gust on an overpass on a freeway when a big gust of wind hit the vehicle. He said one thing they did not want to do was to rotate during a gust. He said he would wait until the gust was over to rotate. He said it was not a sway but the direction of movement was mostly lateral.

When asked about how speed would affect his decision to abort for a loss of directional control, he said a lot of it would be determined by how far down runway he was. He said it was a "feel by the seat of his pant" sort of thing. He said the normal reaction when going off the side of the road on a freeway was not to accelerate but to

brake. He said when going off the runway, a pilot would reduce power followed by deploying reversers and letting the autobrakes do their job. He said that was a part of his briefing. When asked if he would consider doing that over 100 knots, he said if he was losing control of the aircraft then yes. When asked at that speed how he would decide whether to abort or continue, he said if he had full rudder and full opposite wing in and he could not control the airplane and thought he had enough runway to stop, he would abort.

When asked to describe the difficulty of a 27 knot direct crosswind, he said it would be a challenging maneuver, that a 90 degree, 27 knot crosswind was definitely a challenge. On a scale of 1-10, he rated it as a 7. He said the one thing he taught was for a captain to put his right knee on the centerline and that was where the nose wheel would be. When asked if it mattered where the wind was coming from, he said if the knee was on the centerline then that was where a pilot wanted to be. He thought takeoffs were more difficult for him in those conditions. He would say it was a 6 on landing and a 7 on takeoff. When asked what he found more challenging about a takeoff, he said it would be more challenging in Dallas or DEN because of the prairies. He said in Detroit because of wind shearing around the buildings if he was told the winds were from the right he would hold left aileron to maintain centerline. He said at EWR, they got a lot of different shears as the winds swirled over tree lines and buildings.

When asked how difficult a 31 knot direct crosswind would be, he estimated it to be an 8 or a 9. When asked if he had ever encountered that he said he knew he had on landing but was not sure on takeoff.

When asked about a direct crosswind of 31 knots, gusting to 37 knots and if he would request another runway, he said he probably would ask for runway 25 if winds were out of the west. He said he had never gotten a hard time from controllers at DEN when requesting another runway, but had at Chicago.

When asked if there was any performance difference on a B-737-500 with winglets or without, he said on landing with winglets the airplane floated a little more but he could not recall a difference on takeoff.

When asked about differences between the B-737-500 versus other B-737 series, he said the B-737-800 and B-737-900 series were not as responsive, and in a crosswind it was more challenging on landing, but less challenging on takeoff. When asked why, he said the B-737-800 and B-737-900 were more challenging because of the wing design and higher reference speeds. He said they did not respond as easily. He said on takeoff the B-737-500 got off the ground quicker so the tendency was to rotate a bit quicker and pilots had to be more careful of the tail. On the B-737-800 and B-737-900, he said the rotation had to be slower.

When asked about crosswind limitations, he said previously on dry runways, 35 knots was the maximum crosswind but in the most recent revision it was 33 knots for a dry runway, 23 knots for a wet runway, 16 knots for standing or slush and 21 knots for snow. He could not remember if they were hard limits but said they were demonstrated limits and were the winds on the day that Boeing certified the airplane with the FAA.

Asked when it was acceptable to use the tiller, he said above 20 knots a pilot was not supposed to use it and its purpose was for slow sharper turns. He said on takeoff, he would hold the tiller until the rudder was effective which was usually at 40-60 knots, usually until the power stabilized, and then he would release it. He said he would let RTO autobrakes do the braking if necessary.

Interview:	Dale Clark, Continental Airlines, Line Check Airman B-737
Represented By:	N/A
Date:	January 28, 2009
Time:	1205 CST
Location:	Continental Airlines Training Center
Present:	Operations/Human Performance Group

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

His title was captain and line check airman on the B-737. He had been a line check airman since the middle part of 2005, for 3.5 years. He had been with the company since 1986. He joined People Express in 1984 which merged with Continental Airlines in late 1986/early 1987. He had between 6,000 and 7,000 hours in the B-737, all as captain. He had about 17,000 total flight hours. He was first officer on the MD-80 previously, and then transitioned to captain on the B-737.

Mr. Clark administered IOE (initial operating experience) for new pilots after they finished training in the simulator. When asked what he looked for in terms of criteria when evaluating pilots when doing crosswinds, he said he separated IOE from line checks and approached things differently.

For IOE he had to figure out at what level the pilot was, and tried to bring him up to minimum standards and, hopefully, beyond that, where the margin of safety was wide. Regarding crosswinds, he wanted to see the pilot handle it well, follow proper procedures, know what was going on, not leave the runway centerline or if he did, to smoothly get back to it, and make the correct judgments as he took off. If it was a strong or gusty crosswind, determine if he had discussed alternatives, whether he should go or not, change runways, or use more power. He wanted to see the pilot give some thought as to whether what he was about to do was safe.

For a line check, he was assuming the person was already up to a certain level. He wanted to see whether he was performing to a certain minimum level or higher, where the margin of safety was significant. If the takeoff involved a crosswind and it was approaching the point of a safety concern, he would want to see some crew discussion about it. If the situation were such that it was an “everyday crosswind,” then he would not necessarily expect them to discuss it or to discuss changing airplane configuration, takeoff power, or runway.

When asked how much crosswind would trigger more concern in his mind, he stated that it would depend on the situation. Not long ago he was flying a line flight on a snowy day out of Chicago. They were using runway 9 with strong crosswinds from the north. It was in the middle of a blizzard and they were the first airplane to go out. He looked at the situation and to determine if it was within limits and decided he was not sure the margin of safety was there. He went back to the gate for four hours and waited for more runways to open. It was within “textbook limits,” but if anything else went

wrong, like an engine failure or some other unforeseen complication, the margin of safety would be too small. He used his judgment and was never "called on the carpet," nor did he expect to be. If the runway was clear and the winds were within the guidelines and the pilot was experienced and felt like he was fully capable, then approaching those guidelines would be fine. The question would be if there were a better alternative within reason. If one could request a better runway, why expose himself to a difficult takeoff if a better alternative was available.

He stated that he would feel comfortable requesting another runway. In some situations he might know that regardless of what he requested, they would not give it to him or it would result in a huge delay and they might try to herd them in one direction, but he said you can put "your foot down" and say you are not going to do it.

The crosswind guidelines for the B-737 were 33 knots for a dry runway and 23 knots for a wet runway. When asked if the crosswind guidelines were hard and fast, he said that his interpretation was that they were just guidelines and that it was up to the capabilities of the pilot. This means that if the pilot did not feel up to speed that day, or was not comfortable from an experience level, then he should be more conservative. He stressed that a great deal during IOE. During the first 100 or 200 hours those limits should not necessarily be an individual pilot's limits.

Asked whether the guidelines applied to steady state winds or gusts, he said the book did not discuss that, so the gusts should be included. If the wind were 10 knots gusting to 50, he would not want to take off. From a practical standpoint, if it were gusting to 34 knots an hour ago, that probably falls within the guidelines.

Asked about what scenarios would lead a pilot to a rejected takeoff in training, Mr. Clark said that it had been stressed to reject the takeoff above 100 knots for a safety of flight item where you feel like the airplane was not safe for takeoff. That would include confirmed power losses, configuration problems such as flap or slat out of position, or unable to continue the takeoff in a safe manner. There were many scenarios that could be thrown at you at the last second where you would feel it was unsafe.

Asked whether he had been trained for anything other than an engine failure, he said yes, such as a nuisance annunciator light above 100 knots in the simulator. The pilots were trained for that. There had also been simulations of blown tires after 100 knots. In those two scenarios, the pilots were expected not to reject.

When asked if he saw any problems with new pilots handling crosswinds, he said no. He has seen a couple of techniques on landings where some pilots try to "keep it in the crab and kick it out at the last minute" while others lower the wing a few seconds before touchdown. For takeoff, he did not think that he had seen anything of significant concern regarding techniques. Some years ago, it used to be starting a takeoff roll with practically a full yoke deployment into the wind then gradually take some of it out. He had not seen that for a number of years. The awareness of spoiler deployment must be there, but that was just a guess.

When asked if tire failure above 100 knots was a no-reject scenario, he did not remember any discussion about it so it was his assumption that it would be better to not reject the takeoff.

When asked whether he recalled the line check with the first officer, Mr. Clark said his name did not mean anything to him. He pulled up his picture on the computer. The picture looked familiar, but he did not recall the line check. Based on the date he was given (May 28, 2008), the line check was from Chicago to Houston. The captain on that flight was on a "do list" and needed a line check. He did not really recall the line check. There was nothing out of the ordinary, which would have gotten his attention.

When asked to describe the difficulty of a direct 27 knot crosswind on a dry runway at night, his first reaction was that you have to work at it, but it was doable.

When asked if that would be enough to prompt him to change runways, he said, yes, especially if it would not require a half hour delay or be especially difficult. He said, "why not? Unless it would go against traffic." With 27 knots of crosswind, he would probably go ahead and take it, if there were no other threats.

He was asked about Denver with all the traffic going off the north-south runways, he said he would probably not request an east west runway with that wind. Since he knew about the accident, the tendency to say yes was there, but he thought that would be hindsight. If they were doing the takeoffs and landings on the north-south runways with 27 knots of crosswind, and there were no changes and it was not deteriorating, and there was no rain or gusts, then chances were that he would feel comfortable with that crosswind.

He stated that if there were a direct crosswind of 31 knots with gusts to 37, that would warrant another runway. His only hesitation was that if he were at the end of the runway and it had been 27 knots all along and all of a sudden they report 31 knots gusting to 37, now pilots have an internal pressure that says "okay, maybe we should press on, but we have to fight it." If it was above the limits, above the book limits, he said it would be better not to do this and to find an alternative solution, even if meant having to stay at the gate for a while.

He was asked to rate the difficulty of a 27 knot direct crosswind on a dry runway on a 10 point scale. He said his first reaction was to give it a 7, mostly because the "stakes are so high." If the stakes were not so high the difficulty would be lower. A monitored visual approach to 100 feet might be more difficult but it was much easier to recover from, if things went poorly compared to doing a missed approach when so close to the ground and committed.

He was then asked to rate the level of difficulty with a crosswind of 31 knots. The last simulator event had a real strong crosswind. He did not recall what it was but it was significant. He thought it was right at the guidelines, maybe a knot or two below. He thought it was on landing and it was difficult. It was a challenge. It was visual some ways out on the landing but it was a challenge. He also recalled experiencing strong crosswinds at Newark. It was something to be respected.

When asked if he ever recalled having to use full rudder to correct directional control during a takeoff, he said, no. He did remember some landings that were interesting.

He was asked if he would consider rejecting a takeoff if he were having difficulty maintaining directional control. He stated that at some point, if you cannot maintain directional control, what else are you going to do? Yes, early on you have to reject the takeoff. If close to V_R you know you can rotate at a faster rate and if you have to, you can break ground fast. Then he probably would not reject the takeoff.

He was asked if he would initiate an RTO if the airplane were going to go off the edge of the runway, he said that if close to V_R and he could not maintain directional control then he would continue rather than reject at that high a speed. At V_R he knew that in an emergency case he would have some energy where he could rotate early and break ground relatively fast, but this obviously would be considered desperate measures.

He stated that he did not notice any difference between the B-737-500 with winglets versus one that did not have winglets during crosswind takeoffs. He did not feel strongly about that if someone could prove there was a difference, but he did not remember anything.

When asked if there were a difference in crosswind takeoff performance or handling for the B-737-500 versus other B-737 models, he said it was more “squirrely.” It is more responsive. You feel the difference, what he attributed to the tail not being quite as far back there. That is true in most phases of flight on the B-737-500.

He said that he had encountered a major gust of wind on takeoff. Two places came to mind: Calgary and Denver, at least from what he had experienced. In Denver he experienced it on landing and a few times on takeoff. In Calgary, everything was fine going down the runway and then just halfway or three quarters of the way into the takeoff roll, the airplane just started “heading for the weeds.” The only thing he could figure was that there was some kind of quick shift of winds which was not reported by the tower.

The shift lasted, in distance, perhaps 500 to 700 feet. He did not know what that would equate to in time. The airspeed was relatively high, somewhere around 120 or 130 knots.

He forced the airplane back towards the center line, delayed rotation a bit until it was tracking the centerline, and then rotated. It was something out of the ordinary and he had to take command to get back there, primarily using the rudder. He did not recall which type of B-737 it was, perhaps a B-737-300, but he did not know for sure. He thought that in this case it was a deviation to the left and he was sure the right mains were left of centerline. The left main would not have come to the left edge. He did not recall what the reported winds were at the time. The winds were not something he was concerned about at the beginning of the takeoff roll. It was kind of a surprise. He did not recall how much rudder he had to use to get it back to centerline. He just did what was necessary, somewhere in the neighborhood of 50 or 60 percent of the rudder throw. He did not consider doing a rejected takeoff because he did not see any need for it. He

had control of the airplane. It was responding and doing what he needed it to do. He did not know for sure if it was a gust, but the airplane just started deviating from centerline immediately to the left. That was how he noticed it.

He did not feel like it was sliding out from under him, just going in a different direction than it had been a split second before. He did not feel a sudden rotation in the vertical axis, suddenly it was a change in direction with a forward motion.

He did not feel a tug on his seatbelt. He may have experienced some rocking, but not enough to tug on his seatbelt.

He was asked when doing IOE if he ever had to correct pilots on the use of the tiller during landings or takeoffs, i.e., for getting on the tiller too early or keeping it too long. He said that he does not usually have a problem in that area with the average student. If a pilot was transitioning to the left seat, when the first officer had landed and the captain begins to take control after decelerating, he makes it a point to tell them to stay away from the tiller until it was “good and slow.” He saw a little more susceptibility at that point than at the beginning of the takeoff roll. He did not see much of a problem on this so he had not discussed it too much.

There was some heading change with the deviation during the Calgary incident. There was no sliding. He used about 50 to 70 percent of rudder to get it back. During the incident he did not remember hearing any tire scrubbing. He remembered saying something to the first officer but he did not remember saying anything specifically to the tower. That was something he now watches for at the high altitude plains airports out west.

Interview:	Nick Garcia, Continental Airlines, Captain B-737
Represented By:	Daniel G. Orfield, ALPA Legal
Date:	January 28, 2009
Time:	1414 CST
Location:	Continental Airlines Training Center
Present:	Operations/Human Performance Group

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

His current position was B-737 captain based in Houston. He held no other positions at Continental. He had been on the safety committee, but he was not currently. Previously he had been a check airman in Cleveland from 1995 to 1997. He was not currently a check airman. His date of hire was March 24, 1984. He had roughly 25,000 hours total flight experience. He had 10,000 hours in the B-737. He had become a captain in November of 1995. He had about 5,000 hours as a B-737 PIC. Prior to that he had been a first officer on the B-737 in Los Angeles for 4-5 years.

Mr. Garcia had flown with the accident first officer. He had met the accident captain once or twice in the crew room and said hello. He had just facial recognition for the accident captain. He knew the accident first officer because of their trip together October 23, 2008. It was a four day trip. It was his first and only trip with the accident first officer.

The accident first officer was a very likeable guy. He remembered him when he saw his name in the paper. He was sociable. Asked to describe his overall proficiency relative to other First officers of similar experience, Mr. Garcia said he had been above average in a lot of ways. He had felt comfortable around him. He was friendly, easy going, responded when one said something, and was attentive. He was professional and alert. He was all the things he wanted in a flying partner.

Their four-day trip had been unremarkable. Only one aspect was unusual. Mr. Garcia had flown the first leg into DCA for a night landing. The next day when they came out to the aircraft, there was an MEL that the #2 thrust reverser was inoperative. This was the accident first officer's leg back to IAH. The airplane was a B-737-700, #733. They flew it for two legs. The accident first officer had it for the first leg, landing in Houston. Mr. Garcia remembered a little bit about the thrust reverser because DCA was a short runway. They had discussed it and talked about what they would do if they had to reject.

The leg to IAH was Mr. Garcia's first chance to see the accident first officer fly. He was very good, made the right callouts, and made no mistakes or errors. They were given vectors during the climb toward Houston. There was nothing unusual on landing at IAH. They briefed the reverser inoperative. The accident first officer had used idle reverse after touchdown, and never left the centerline. They transitioned to Mr. Garcia

at 80 knots. There were no digressions that he remembered during the high speed rollout. There was nothing unusual at all.

The reason he got to know the accident first officer was that on the last day of the trip, the third night, they had a layover at LGA overnight. He and the accident first officer had visited the Metropolitan Museum of Art in New York City. The both loved hot dogs, so they bought street vendor hot dogs. Mr. Garcia ate two and had a stomach ache the whole way back, so that was why he remembered the trip back. After they got back to IAH they said goodbye and he did not hear about the accident first officer again until the accident. During their trip together the accident first officer had the controls for three legs, flight 1859, 1527 and 1433.

Asked whether he had noticed anything unusual about the accident first officer's habits or behavior in the airplane, Mr. Garcia said no. He added that most people had some bad habit, but the accident first officer was just a "blank slate." There was nothing unusual about him. Mr. Garcia said he probably would not have remembered him if he had not eaten that second hot dog.

Continental's crosswind limitations for the B-737 on takeoff were 33 knots. On a wet runway it was 23 knots, hard packed snow 21 knots, slush 16 knots.

Asked how prescriptive those limits were, Mr. Garcia said that 33 knots was a limitation of the aircraft that he took very seriously. Anything near that was going to raise a red flag on a dry day. On a wet, rainy day, 23 would raise eyebrows and the crew would talk about it. With slush and snow, 10 knots might be too much. Runway 28 in Cleveland with braking action poor would be a bad situation. He might want to wait in that situation. The numbers were not "never to be exceeded" but one also might want to think about a crosswind that was even less than that. The numbers were not always in the forefront of a pilot's mind as much as whether they could handle the situation. Asked whether he meant to say that a pilot's personal limit might be different than the published guidelines, Mr. Garcia said "It may be less, yes."

Asked to describe how difficult he would expect a 27 knot direct crosswind takeoff to be on a dry runway, Mr. Garcia said he would think it would require almost full right rudder. His recollection was that a 25 knot crosswind on landing was a handful in the B-737-500 or B-737-700. The shorter airplanes were a little more difficult for some reason. On a scale of 1-10 with 10 being most difficult, he would rate it about a 7 in difficulty on a dry runway with two good engines. Asked whether he would describe that rating as moderately difficult, he said yes. It would take one's full attention. A pilot would have to think about it and would be fighting to keep it on the centerline.

Asked whether he would request a different runway at DEN if the flow was north-south and there was a 27 knot direct crosswind from the west, he said, "No, I probably would have gone with the flow."

When asked how difficult he thought taking off in 31 knots of direct crosswind gusting to 37 on a dry runway would be, Mr. Garcia said that amount of wind would exceed what the aircraft could do, so he would delay the takeoff until the numbers decreased. If it was just 31 knots he would go, but not beyond that. Asked whether he

was concerned about the gust value as well as the steady state value, Mr. Garcia said, yes because the gust might exceed his ability to hold it on the runway. Asked whether 31 gusting to 37 would prompt him to request a different runway, Mr. Garcia said it would prompt him to request a different runway or delay the takeoff.

Asked whether he would expect to encounter a hassle at DEN if he asked to change to a different runway he said, “You might hear a sigh or two, but so what. You hear them all the time with special requests.”

When asked if he ever recalled using full rudder during a crosswind takeoff, Mr. Garcia said yes. The only time he ever recalled leaving the centerline, it was his very first leg on IOE, in November 1995. He was in a B-737-300. He noticed that he could not steer the airplane with just the rudder pedals on the taxiway. He told the check airman he was flying with that the rudders did not seem to be responding. The check airman took the rudder pedals and thought they were okay. During takeoff on runway 15 at IAH, however, there was a crosswind from the left and as they kept rolling on the runway, he was leaving the centerline and drifting to the left. The airplane would not correct back with full rudder. They rotated and it seemed normal after liftoff. He told the LCA he was with, and the LCA said he would check it on the next leg. They had the same problem on the next leg in Mexico. They flew the airplane back to IAH and wrote it up. Mr. Garcia recalled that the captain had followed up and said the company had found something wrong with that rudder. That was Mr. Garcia’s only experience where he could not hold the airplane on centerline. Asked where the airplane was relative to the runway edge at rotation, Mr. Garcia said it was between the runway centerline and the left edge. Asked at what speed the deviation occurred, Mr. Garcia said he could not recall. He just recalled his frustration and bewilderment.

Mr. Garcia was asked what it would take for him to reject the takeoff if he had an uncontrolled deviation from the centerline. He said that if he saw the same problem again he would probably reject the takeoff, adding, “I say that now, but who knows what I’d really do with other factors there.” He stated that he thought the safest thing with the long runway there would be to reject, but that the incident flight was his first actual flight in the left seat after simulator training and he thought maybe the actual pedals just felt different. This was in November 1995.

Asked whether he recalled the CQ MV training provided in 2004-2005, with a special emphasis on crosswinds, Mr. Garcia said he recalled there were rejects, but did not recall the crosswind. He thought all the MV’s had crosswinds.

Asked whether the accident first officer was the kind of person who would be willing to speak up if a captain did something wrong, Mr. Garcia said, “Yes, absolutely.” Mr. Garcia added that in his briefing he encouraged first officers to monitor his performance and speak up if he made an error. The accident first officer was “one of those guys, a good monitoring pilot.”

Asked whether, in his experience, taking off or landing in a strong crosswind with the first officer flying, he had observed first officers having any particular difficulties, he said no, everyone had pretty much the same technique, but they were all “in the

ballpark." He stated that he had never had to take the airplane away from a first officer in all his flying as a captain.

Mr. Garcia was asked under what conditions he would use tiller steering. He stated that it was used at the beginning of the takeoff roll. About 60 knots he made a transition to the yoke. He stated that some takeoffs without a crosswind the airplanes just stayed on the centerline. He did not actually know when he left the tiller. He thought it was when he knew the airplane was going to stay on the centerline and he transitioned to the yoke and pedals. Asked whether he typically briefed anything about that, he said no.

Asked to describe the accident first officer's CRM during takeoffs, Mr. Garcia said it was good. The reason he did not recall so much about him was that his behavior fit right in the normal envelope. He felt the accident first officer was a good pilot who knew what he was doing. The accident first officer was also articulate and said no more or less than was expected. He covered all the relevant points. He was the kind of guy you wanted to fly with on your next trip. He would never hesitate putting his own life or his family's life in his hands. He would be glad to fly with him tomorrow. He had no reservations about him.

Interview:	Michael Wood, Continental Airlines, First Officer B-737
Represented By:	Daniel G. Orfield, ALPA Legal
Date:	January 28, 2009
Time:	1500 CST
Location:	Continental Airlines Training Center
Present:	Operations/Human Performance Group

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

He flew with the accident captain on December 11, 2008.

His position was a B-737 first officer based in Houston until January 21, 2009, when he went on a leave of absence. He planned to come back from the personal leave of absence in April 2012. He was hired by Continental Airlines on November 16, 1998. He was a B-737 first officer from 1998 until September 2001, when he went on a leave of absence and into the military. In January 2006, he was a B-737 first officer out of Houston. In the military he was primarily an instructor on the T-37 and T-6, currently working with BAE systems to go teach the Saudi Air Force how to fly for three years. He flew C-141s for 3 years from 1995 until 1998, accruing just under 1,400 hours. He had total flight hours of 9,728, including 4,646 hours in the B-737, all as first officer. He had not held any management positions.

He stated that he flew with the accident captain on a Las Vegas "red eye" turn around. That was his only experience with him. He had no idea about the accident first officer. He stated that he took notes in a logbook about the good and bad stuff relating to the captains he flies with. He did not have notes on the accident captain so he was fine to fly with. If there were particularly good or bad things to say about him, he would expect to have notes about him.

Mr. Wood had investigated accidents in the USAF so he took good notes. He did not recall the captain's personality but he recalled that he was "fine to fly with." They chit-chatted during the trip. Mr. Wood had a proficiency check coming up on the 21st. He was trying to review for the check ride during the flight so Mr. Wood was not as chatty as he normally would have been.

Mr. Wood described the captain's performance as a perfectly standard typical Continental Airlines flight, by the book. The weather was fine. The captain flew the leg to Las Vegas and Mr. Wood flew the leg back to Houston. Mr. Wood did a whole bunch of red eye turnarounds in December.

There was nothing unusual during the flight, just standard great weather. They landed at 2300 after executing a visual approach.

Mr. Wood stated that the Continental Airlines maximum crosswind guidelines included a demonstrated crosswind component of 33 knots with the winglets. He has landed in those winds. That was fine, well within the airplane's capability.

When asked how difficult a takeoff would be with a 27-knot direct crosswind on a dry runway, he stated that he had done that plenty of times. He used "cross controls" and took off. On a scale of 1 to 10, he would rate the level of difficulty average, a 5 or 6.

With crosswinds of 31 knots with gusts to 37, he stated that he has landed in some nasty gusty winds. He did not think it is was that hard. It is based on experience and type of airplane. Sometimes he has his worst landings with winds at 10 knots, and his best landings with winds at 35 knots, howling down the runway. It is well within the capabilities. He has landed and taken off in plenty of rough winds. He would probably rate them the same. You would have to think about it. If you got caught off guard, it could be tough. Usually it gets "briefed to death" so everyone is ready. When asked if he would request a different runway under those conditions, he said, no, it would not have crossed his mind.

If the wind were 31 knots gusting to 37 knots, he said he would be more concerned about the steady state winds than the gusts, but he did not think that he had ever actually been faced with a situation where it was gusting beyond the limit. It would depend on what they were calling the winds at takeoff. Under these conditions, it would make a difference for him, personally, but he said that he would probably be comfortable with it. It would depend on weather (thunderstorms, rain), runway conditions (dry, wet, short, long), and lots of other variables.

As a first officer he stated that he would not be that concerned about it but he would brief it and ask if this is something they really want to do. If the answer made sense then he would do it. If he were uncomfortable with it, he would "put his foot down and not go." He said that he had spent most of his time in the military, so his tolerance level was "pretty low for nonsense." Other people might make a different decision.

When asked why he would "put his foot down," he said because of windshear reported in the area. He said he had done this two times last summer. Houston was experiencing thunderstorms and windshear. The first time was when they were number one for takeoff and he said that he just preempted everyone and said they needed to sit there a few minutes and think about it. Then all the other airplanes said they would think about it, too. The other time was during a line check. He was not comfortable going and questioned the takeoff and everyone said, yes that is the right decision. The company was really good about that. Captain's were open to input.

The biggest crosswind he had ever landed a B-737 in was with 35 knots at Cleveland. It was a line check and it was his leg. The captain was laughing and said he was glad it was his leg. He did not find that landing to be particularly difficult. He stated that he lands better during those situations than in 10 knots down the runway. You concentrate more and have to think about it. If you were not ready for it, it would be very hard.

He said that he never had an occasion to use full rudder during takeoff.

When asked what it would take for him to want to reject the takeoff because of difficulty keeping the airplane on centerline because of wind, he said, up to 100 knots, he would stop for many things. Above 100 knots, it would take a confirmed power loss or something that would keep the airplane from getting airborne. If something was not going right and he could not maintain the centerline the situation could be interpreted as a flight control failure, either the airplane was not rotating or it was departing in some direction you did not think you commanded it to. They teach in the military to only stop for a confirmed power loss or something that will prevent you from getting safely airborne. Flight controls are a big deal.

When asked how he interpreted the 33-knot demonstrated crosswind, he said, that from his background that was a good question. He said if a pilot went above that number, he needed a pretty good reason. Asked what a good reason was, he said "who knows, but you would probably have to say why you did it."

Observing lots of captains landing from his perspective in the right seat, he had not seen any particular problems taking off or landing in a crosswind.

He stated that he did not think he had ever seen anybody keep their hand on the tiller for takeoff. He was not sure about when they took it from him on landing. He was looking outside. He never looked inside at that point.

Interview:	Ronald Wind, Continental Airlines, First Officer B-737
Represented By:	Daniel G. Orfield, ALPA Legal
Date:	January 28, 2009
Time:	1530 CST
Location:	Continental Airlines Training Center
Present:	Operations/Human Performance Group

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

He was based in Houston as a first officer on the B-737. He was hired by Continental Airlines on March 8, 2006, and had held no other positions with the Company. His total flight time was 9,700 hours including 2,200 hours as a first officer on the B-737 at Continental.

He stated he did not know the first officer of the accident crew and had flown only once with the accident captain. He characterized the captain as what he expected a captain at Continental to be. He described the captain's personality as easy to get along with and he could not remember anything being out of the ordinary. He could not remember a whole lot about it, which was usually a positive thing. He stated nothing stood out when comparing the accident captain's proficiency in relation to other captains.

He had flown a four- day trip beginning on December 4, 2008 with the captain. Mr. Wind stated they had switched flying every other leg. The captain had flown out of the bases and he had flown into the bases. On day two of the four-day trip Mr. Wind remembered they changed to a departure out of EWR that neither of them had done before. Mr. Wind stated he pulled out the chart and set it up for the captain. Then the captain checked it and said it looked good. Mr. Wind said the departure went fine. It was just something he remembered both of them working on.

Mr. Wind said the crosswind guidelines at Continental for take-off on a dry runway was 33 knots. He also said the wet runway crosswind guideline was 23 knots, that for slush it was 16 knots and for snow it was 21 knots. When asked how he interpreted the numbers and how prescriptive they were, he said the guidelines were in the limitations section of the manual but it was a recommendation. He preferred to consider them to be limitations for his experience level. The biggest crosswind component in a B-737 he had taken off in was probably in the high 20's.

He stated he would not classify taking off on a dry runway with a steady 27 knot direct crosswind as difficult or as anything to keep in mind. He would do whatever the airplane took and not go beyond that but it would require more input than a no wind take-off. Mr. Wind said a 27 knot direct crosswind on a dry runway would not prompt him to request a runway change that was contrary to a big airports traffic flow. He stated that he would be thinking more of where the wind was coming from than of using an alternate runway.

Mr. Wind stated he would probably request a different runway if the direct crosswinds were reported to be 31 gust to 37 knots. He said a flag would be raised and he would consider that to be outside the recommended limits so he would think more of asking for another runway as opposed to how difficult the takeoff would be. He said he would not hesitate to request another runway at DEN under those conditions and that the same thought would come to mind at any airport.

At slower takeoff speeds with a good crosswind he recalled putting in a significant amount of rudder deflection in a B-737. He was not sure how close this was to the stop but it was usually at a lower airspeed.

He stated he did not see any particular problems with captain's handling crosswinds in takeoff and landing. Everyone pretty much used the same technique and had good days and bad days.

Mr. Wind could not tell if the different models of the B-737 handled differently in a crosswind. He stated they handle differently and he did whatever it took in that airplane not really thinking about the type. He said the amount of stability and the amount of control required varies even within the same type of aircraft depending on how the aircraft was loaded or how much it weighs.

He felt it was his responsibility to question a captain for a crosswind takeoff if he thought it was unsafe or out of the limitations. It was what he was hired to do. He would say something if the crosswind was over 33 knots.

Interview:	Michael Martin, Continental Airlines, Captain B-737
Represented By:	Daniel G. Orfield, ALPA Legal
Date:	January 28, 2009
Time:	1550 CST
Location:	Continental Airlines Training Center
Present:	Operations/Human Performance Group

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

His date of hire by Continental was January1997. Prior to coming to Continental, Captain Martin was with Continental Express. He was hired there in 1989. He had about 20,000 hours of total flight experience with about 8,000 hours in the B-737. Other positions held at Continental were, 2nd Officer on the B-727, First Officer on the DC-9, and first officer on the B-737. He stated that he held no management jobs.

When asked if he was familiar with accident crew, Captain Martin stated that he flew with First Officer Levang probably four times in last two years. He said that he did not know the captain and that his most recent trip with First Officer Levang was a four-day trip that started on 10/30/08.

Captain Martin was asked what kind of person was First Officer Levang was, he stated that he was the kind of person I would like to have as a son. He said that First Officer Levang was a nice guy and also a pleasant guy to work with.

When asked about First Officer Levang's proficiency relevant to other First Officers, Captain Martin stated that he was honestly in the top 5 percent. He also informed us that they were both getting ready for their recurrent training in November 2008. They practiced all of their callouts and used each other as sounding boards. Captain Martin stated that it was a good trip and they both got up to speed.

Captain Martin was asked if there was anything unusual that happened during the flights. He said no and that it was a normal trip. They had 2 LGA overnights and that arrivals and approaches there were always challenging. When asked if First Officer Levang had flown any legs, Captain Martin had stated that First Officer Levang had flown at least 50 percent of them. He also stated that First Officer Levang had also flown one LGA arrival and one CAT III approach into IAH and that they practiced at least two VNAV [Vertical Navigation] approaches for their MV that was coming up.

When asked about anything unusual about his habits or behavior, Capt Martin stated that the only problem he had with First Officer Levang was his use of smokeless tobacco. It was a personal decision for First Officer Levang and as a former smoker he could understand.

Captain Martin was asked about Continental's crosswind guidelines or limits. He said per aircraft it was 33 to 35 knots depending on aircraft type. Thirty-three was for a dry runway for an airplane with winglets.

When Captain Martin was asked about the biggest crosswind he had ever taken off in, He stated that it was in excess of 25 knots out of EWR. He was also asked how difficult it was and Captain Martin stated that it was extremely difficult.

If faced with a twenty-seven knot direct crosswind on a dry runway that was called out by ATC just before takeoff, Captain Martin stated it would be difficult but manageable and that he would have to be very aggressive. On a scale of 1-10 he said it would be a 9.

Captain Martin was asked what he would do if he lined up for takeoff and he was and told the winds were 31 knots gusting to 37, how difficult would it be. He stated that it would not be difficult at all because he would not be going. He was also asked if he had flown into Denver, he stated that he had.

When asked how big of a crosswind he would have to be faced with to ask for another runway or wait, Captain Martin stated that was unfair because he knew what happened, but he would say 25 knots. He added that the problem with Denver with crosswinds was he had to be aggressive, with winds from the west and also weather coming off mountains, he might be faced with mechanical turbulence, lenticular or rotor clouds. The takeoff might be the easy part but you should expect severe turbulence afterwards.

When asked if there was any particular concern about asking to change in DEN versus another airport, Captain Martin stated no – all they could do was say no and then he would not go.

Captain Martin was asked if he could recall the CQ/MV from 2004/2005 with the big crosswind scenario. He stated yes, and that it was out of EWR. He was also asked if he could recall anything in particular with how to handle it. He stated that he just thought they were demonstrating their ability to do it and that he believed the scenario was a left crosswind up to about 25 knots. When asked how difficult it was, Captain Martin stated it was very difficult. He was also asked if it seemed like the real airplane. Captain Martin stated that it seemed like real airplane, but in a strong crosswind like that he had to be very aggressive to keep it on the runway until he had the flying speed and then jerk it off. It was not going to be smooth, so he would want to brief flight attendants. It was not unsafe, but it was going to be an aggressive maneuver.

When Captain Martin was asked if he could recall having to use full rudder on a crosswind takeoff, he stated no. When asked at what point he would perform a RTO because of directional control problems in a crosswind, Captain Martin stated that if he was at full control limits and did not have any more control available. He added that he recently had a First Officer say he landed in France in a DC10 with a 35-knot crosswind and got a medal. Captain Martin asked him if runways go only one direction in France.

Captain Martin was asked if he was hitting full travel in rudder and having some difficulty controlling the airplane, what considerations would he make in terms of continuing or reject. Captain Martin stated that he would hope that he would be in reject mode and go straight there. He remembered from flying tail draggers that if you tap the brake it could bring you back around but that he has not done it in a transport category aircraft like the B-737.

When asked if speed would matter, Captain Martin stated with the higher the speed, the more directional control he would have with the rudder. When asked if he was over 100 knots, he said he would expect full rudder authority and would want to stop.

Captain Martin was then asked about crosswind guidance or limitations and his understanding of that number. He stated demonstrated was by a professional test pilot who knew it was coming at Moses Lake or someplace like that. He was then asked if it was a limit for him and he stated yes, absolutely.

When asked if he used the tiller on takeoff, Captain Martin answered no.

Captain Martin was asked to compare the handling of the B-737-500 with winglets to those without winglets. He stated that the ones with winglets have more lateral stability. He said that landing a B-737-500 in a crosswind is the hardest thing that he has to do for a living, kind of like flying a box kite around 125 knots and above 140 knots it was easier to handle.

When asked to compare the B-737-500 to longer versions of the B-737, Captain Martin stated that the longer versions were very stable.

When asked about his observations of any difficulties for First Officers flying in crosswinds, Captain Martin stated that very few were not as aggressive as they should be. He thinks that people who come out of military are flying planes that were beefier. He said that he flew with a KC135 guy and he expected him to slip into a crosswind landing, instead he just touched down and it straighten itself out because that is how they did it in the Air Force.

Asked to characterize the stability of the B-737-500 with winglets on landing, he said it did not matter whether on takeoff or landing, the winglets provided more surface area to help keep it straight.

Interview:	Toby Carroll, Continental Airlines, Director of Flight Safety
Represented By:	N/A
Date:	January 29, 2009
Time:	0830 CST
Location:	Continental Airlines Corporate Headquarters, Houston, Texas
Present:	Operations/Human Performance Group

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

His title was director of flight safety. He had been with Continental Airlines for 23 years and had the same job the whole time. He was in charge of the flight safety side of the safety department. He had started out as a manager of flight safety evaluation, then was director of flight safety investigations. As new programs came on board he became director of flight safety. He provided oversight for all the flight safety programs. Mr. Carroll had brought all the new safety programs on board at CAL, such as FOQA and ASAP [Aviation Safety Action Program].

When asked to describe his aviation background, Mr. Carroll said he was in an Army ROTC flight program in college. He graduated and went to fixed-wing flight school. From there he went to Vietnam and flew there. Then he came back and was at the Army Center at Ft. Rucker, where he headed the Survival Evasion and Escape school. After that he left active duty and spent 20 years in combination of reserve and national guard duties, retiring as a major from the reserves. Most of his reserve time was spent working in aviation safety. He worked mostly as a brigade aviation safety officer with responsibility for four states and 200 aircraft, mostly rotary wing.

Mr. Carroll held a commercial single and multi-engine pilot certificate with instrument ratings. He also held a commercial rotorcraft certificate with a rotorcraft instrument rating and an A&P. Mr. Carroll was not currently an active pilot. He remained active in the National Guard until 6 or 7 years ago. Mr. Carroll had never flown for Continental. A couple of times he had been encouraged to do so, but it was hard to get away from the flight safety office for 6 weeks at a time.

Mr. Carroll's total flight experience was 1,800 to 2,000 hours, primarily fixed wing. About 400 hours of that was rotary wing flying. His educational background was a bachelor's degree in liberal arts. He had taken additional courses but had no additional degrees.

When asked to describe his duties and responsibilities, he stated that his job was primarily that of monitoring daily activities within the company, looking for flight safety related issues and problems, and ensuring there is a proper investigation or that the proper groups in CAL are working toward the solutions that are identified. Mr. Carroll had oversight responsibilities for the flight safety database, the FOQA program, the ASAP program, the LOSA program, and the safety investigation team.

The flight safety' department's place in the corporate hierarchy was as follows. The CEO was at the top. Don Gunther, staff VP of safety, had a direct line of communication with him, but his administrative supervisor was Mark Moran, the Executive VP for Operations. Don was the administrative manager for flight safety, ground safety, medical programs, and regulatory affairs. There are about 45 people total in all four safety programs.

They had a safety policies and procedures manual for the safety department and a safety programs manual for employees. Don Gunther reported directly to the CEO. Mr. Gunther interfaced with Mr. Moran on a daily basis. Administratively, Mr. Gunther worked for Mr. Moran, but Mr. Gunther had the eyes and ears of the CEO of the company.

Mr. Carroll was asked how many staff worked in the flight safety department. He stated that the flight safety department included four full time people and three part time people. These included Mr. Carroll, two people in FOQA, two part-time interns who worked both FOQA disk processing and the safety database, an ASAP/LOSA manager, and a part-time person who assisted the ASAP/LOSA manager.

Mr. Carroll was asked to describe the flight safety database. He stated that it was called the Continental Airline Safety Information System (CASIS). They had maintained this database since October 1996 in its current form. It had been preceded by a more rudimentary system. For a number of years they had put every single captain's irregularity report in the database, and they had entered operational irregularities from the duty director as well. Three years ago, they decided not to enter reports of passenger medical problems unless they affected the operation of the airplane. The safety department entered an average of 7 reports per day into the database. They entered anything safety-related that they could get their hands on. They were currently at about 31,000 reports in the database. The software they used was an incredible tool for trending and analysis.

The flight safety department held weekly operational safety investigation meetings where they looked at all the reports entered in CASIS over the previous week. They assembled anybody from the department who was available to discuss issues related to the reports. The reports were risk assessed. Those judged of medium or greater significance were discussed to determine whether there was a need for follow-up action. People were assigned to do the action items. Later, the group voted on the acceptance of the action as being completed and they would close it out.

Mr. Gunther used the CASIS data for a presentation at a quarterly review board with the officers of the company including the CEO, president, and executive VPs. He had been very successful. For the last 6 or 7 years, especially, since Mr. Gunther had taken over the department. Mr. Gunther had been very good at getting the interest of the high level executives.

Continental's FOQA program had been in place since 1996. That was when they started it. They were fully up and running in 1998. The first two years they were involved in a demo project with the FAA and they were getting the equipment up and running and working out agreements. From the very beginning, they had excellent cooperation,

which was essential for a program like this. They were previously involved back in 1990 with trying to get a FOQA program started and they were working with an airline called SAS. They had presented it to the executives, to the FAA, to the pilot's union, and to flight standards. They had an agreement with the FAA to try it with one airplane, but then Continental filed for bankruptcy and the program was put on hold. It was frozen until 1996, when the demo project was begun by the FAA to foster airline interest in FOQA. Continental was the second airline, after United Airlines, to embrace FOQA.

Continental currently had FOQA recorders on all of its fleets, except the B-737-300. It was not installed on the B-737-300 because the airplane had limited sensors. The airline was gradually getting rid of the –300s and because all B-737 pilots also flew the other variants, they decided not to go to the expense of retrofitting those airplanes so they would record additional parameters.

The purpose of the FOQA program was to provide routine flight operational quality assurance by electronically monitoring all aircraft activities. They used the data to identify issues and see where problems were and to take those issues to areas of the company that could affect change –bulletins, training, or maintenance and engineering. Mr. Carroll felt that once a company had its flight operational stuff under control, the best use of FOQA was to work on maintenance and engineering issues. Any time they could help maintenance or engineering fix an issue, that was one less chance a pilot might improperly respond if they had a system failure in flight.

Continental had gotten complete support from ALPA on the FOQA program and ALPA worked directly with the engineering folks. ALPA members served as gatekeepers. They had been able to do a lot of really good work using this arrangement.

Asked whether Continental had had any special areas of concentration on the operations side with FOQA over the last year or two, Mr. Carroll said they were working a lot on unstabilized approaches. They had used FOQA to identify safety issues in that area and published findings in a safety newsletter.

Continental's ASAP program had been in place for 9 or 10 years. It began about 2 years after the FOQA program. There were actually five different ASAP programs: flight, dispatch, load planning, and 2 maintenance programs (one for managers and supervisors and another for the union workers). ASAP reports were electronically submitted and went to the ASAP manager who made an initial assessment whether immediate follow-up action was required. Subsequently, an event review committee (ERC) reviewed the reports. The ERC included an ALPA rep, a company rep (Mr. Carroll or John Bauer) and an FAA rep. The ERC met for about 2 days twice a month. As they were reviewed, the reports were assessed as to whether they should be accepted into the program, and whether a crew interview should be performed. For the really important reports, they might bring the crew in live to meet with the ERC. The end goal was to identify safety issues and to make recommendations to the appropriate department, be it an ATC issue for example, or a chart issue.

Mr. Carroll stated that they had been tracking successes for years and they documented them whenever they had one. He stated that the manager of the ASAP and LOSA programs could share a list of significant successes. The ERC determined if

corrective action needed to be taken and came up with a plan. When action on the item was completed, they closed out the report. If for example, there was a runway incursion, they might require the pilots who were involved to redo the computer based training on runway incursions and they would monitor electronically to see whether it was done. They cooperated with FAA to get information in their database as well.

They published a quarterly report and an annual report. They had just finished the annual report for 2008. They put it out for pilots to read. The FOQA and ASAP programs were leading industry programs. Mr. Carroll was very involved in Continental's program and was very involved in the industry ESIAS program, where information was shared to develop industry corrective actions. One of the biggest things they were doing was the development of RNAV approaches. They had a pretty good bulletins on this for line pilots to help get their buy-in. They had noticed an improvement in unstabilized approaches since then. Under Mr. Pizzonia's leadership on ALPA safety committee, Continental had become more open with their data. The steering committee had put together a two-page newsletter for pilots. The safety department was very excited about this because the FOQA data told them things were improving.

Continental had been conducting LOSA audits for about 16 years. The company had been conducting a major LOSA audit every four years, and had just completed their fourth. They had also done smaller scale LOSAs in between. In 1998, for example, they decided to take a close look at the company's Latin American operations. They had also conducted one on Express Jet and one on Continental's Micronesia operation. The audit that was conducted every four years was the general, all-purpose audit. They got a lot of valuable information from the LOSA audits. The findings of the latest audit was presented to company executives just days before Mr. Carroll's interview.

Mr. Carroll was asked whether his department was responsible for flight safety investigations. He stated that he was personally responsible for investigating all incidents that occurred after pushback and that his ground safety director handled all incidents prior to pushback. He personally handled about 25 incidents per year. Those were the incidents that involved about a couple days of work. There were additional incidents that required only an hour or two on the phone.

Mr. Carroll was responsible for coordinating with the NTSB on all reportable accidents as well. When asked to describe the company's accident response strategy, he stated that they had an emergency response manager who was primarily family assistance and who oversaw the company's overall response. They had two teams on the launch airplane to an accident, family assistance and the safety investigation team. The safety investigation team was Mr. Carroll's responsibility.

When asked if the flight safety department had pretty good communication with the flight standards and operations departments, Mr. Carroll said yes. Every once in a while they had obstacles, but they worked through it. The flight safety department had gotten the support they needed. If it was something they felt passionately about, all Mr. Carroll had to do was go to Mr. Gunther, and if Mr. Carroll was right, Mr. Gunther would back him and they would have all the support they needed. It was a little different than years ago when the flight safety department was a "step-child." Continental's current environment was the best Mr. Carroll had worked in.

Mr. Carroll was asked if the flight safety department was aware of any incidents similar to the accident involving Continental flight 1404. He said that he had looked up three runway excursions in his files that some thought were similar to the accident. As with the flight 1404 accident, all three incidents involved B-737-500s. In addition he had had his staff search the safety database. Searching incidents involving B-737's they had found four involving problems with directional control on the runway that did not involve obvious mechanical issues and may have involved wind. They had found some additional reports as well that involved brake issues, rudder binding, and steering issues. Mr. Carroll had already offered this information to the aircraft records investigation group. The rudder binding issue had to do with the wheel-well shrouds. They had not really been seeing it lately. Most of the corrective action was adjusting the shrouds. They were not seeing big problems with it.

Asked to elaborate on the steering issue incidents, Mr. Carroll described the reports. In 2006 during takeoff roll, a flight crew performed a RTO at 90 knots due to crosswind and wind shear. No maintenance issues were identified. Another one occurred in July 2005 during landing roll. The flight crew had to use considerable left rudder, as the airplane was yawing to right. The airplane checked out okay afterward. In another one, the aircraft tiller was stiff and jerky. The aircraft yawed hard right. Maintenance found a bypass valve stuck in position. In another, the flight crew aborted takeoff at 65 knots because they had no rudder steering. Maintenance found that a nose wheel steering circuit breaker was open, and they reset it. None had involved a runway excursion.

Mr. Carroll was asked whether he had identified any reports, other than the report described above that had involved a flight crew rejecting a takeoff or having great difficulty controlling the aircraft due to crosswinds. He stated that they had not searched for RTOs. They had searched for incidents involving rudder and directional control. Based on those search criteria only the one RTO had been identified.

Mr. Carroll was asked how a crewmember would let the safety department know if he had a problem. He said there was an operational hotline they could contact, or they could submit an irregularity report. He said they read every one of them, prioritized them, distilled it down to one or two out of 7 a day that were of more interest. He said when a crew submitted a report, sometimes they did not get the whole story because sometimes they would depart and did not know what maintenance did. He said from a long time looking at this stuff, when a crew submitted a maintenance write-up, they usually put more information there than in the safety report, because the crew wanted maintenance to hear everything they knew to fix the problem. He said the big thing was the irregularity report, and the duty director was empowered by the company to make decisions about what happened and what would be done. He said often times crews would talk to the duty director, and the duty director notified safety about things that happened, because sometimes captains thought everybody knew about it, so why did they need to file a safety report. Other times they would call the chief pilot's office. He said they would look at it for their database, but also to see if they had an issue they needed to get on top of. He said sometimes they just got calls. They usually found that sometimes they call the union and they talk to the union. As a result, the union was put

on all the notification systems and sometimes they jumped on it or heard stuff the safety department was not hearing.

Asked if he responded back to a crew who submitted a report, he said there was a response with ASAP and it was sent electronically. He said on the captain's irregularity reports, the database was set up for them to send a thank you letter and explanation of how it was risk-assessed, but they did not populate the database with the crew information. Occasionally they would call up and tell the crew what they found.

When asked if there were any prevalent safety concerns that stood out, he said they would like to know what happened with flight 1404. He said yes, each fleet had a list of concerns based on the data. The issues that went across the board were unstabilized approaches and they were doing really well with that now. He said they followed rejected takeoffs for several years and it was a special emphasis item in training and they had a dramatic drop in those.

Mr. Carroll was asked if crews got paper copies of bulletins. He said the safety department reports on LOSA and HF were on paper and said pilots liked something on paper. It was usually the B-737 newsletter or "Cliff's Notes." He said each fleet had a newsletter that came out bi-monthly. He said then they had the ASAP program newsletter that was quarterly and the FOQA program had two quarterly editions based on risk assessment and where they thought the biggest problems were and where they needed cooperation of the line pilots. They were already starting to work on their third edition. He said they were very conservative and protective of saying anything in the past, but they had had some enlightened leadership at the company and union and they were doing a better job of getting information out. He said fleet managers were very aggressive at the monthly meetings and they acted on these presentations. He said cooperation improved after safety and ops were briefly under the same vice president.

Asked if any internal changes had come about as a result of 1404, Mr. Carroll said they were "chomping at the bit", wanting to, but they also were very guarded about doing something that was a knee-jerk reaction. The first conversation he had with Mr. Pittman when he came back was whether there was something he needed to be doing. The problem had been that they did not want to do something "stupid", like ask not to schedule any B-737-500s into Denver this time of year. He said they were constantly thinking about what they could do. He tried to suggest to Mr. Pittman that they might want to think about some different crosswind limitations but thought they should not have a knee-jerk reaction until they could make a proper decision. He said they were not embarrassed about doing anything and would do whatever it took, training, scheduling B-737-500s into Denver. They were looking for something they could do to make sure this did not happen. He said they were "all eyes and ears" with the operations/human performance working group, meteorology, maintenance. They were anxious to do whatever it was that was the proper thing to do.

Asked if he saw any jump in pilot reports of anything similar to the accident (directional control during takeoff), he said in the FOQA program they had the military "don't ask don't tell policy." The gatekeepers did not tell them if they contacted the crew. He said he asked the gatekeeper what the tempo's like among the pilots and he heard that people were concerned about crosswinds. He said everybody had seen stuff about

winds in Denver relating to the accident and the troops were kind of anxious. It made people a little bit uneasy. He had not looked to see if they had an increase, but said they normally saw an increase in reports about whatever people think happened.

He said they were very active in ATA [Air Transport Association] efforts to reduce bird strikes and were cooperating with the FAA on reporting as well. He said the maintenance people had kits to take DNA samples.

Mr. Carroll was asked how he was informed of the accident. He said he was on vacation, Friday and Monday of that weekend. He was on a cruise and turned the television on as they were sailing to the Bahamas on Saturday and saw a CAL airplane. His first notification was seeing it on TV a couple hours after the accident and then he got a call from the Operations Information Center (OIC). He spent the night composing the safety investigation team and deciding when they would depart the next morning. He had the director of ground safety stand in in Denver until he could get there. When the ship got to the Bahamas Sunday morning, his bag was packed to get off the boat, but there was a big storm, so they thought he might get stuck in Newark, so he got off the next day in Miami. He got to Denver at 3:30 on Monday. He said the safety investigation team was supposed to leave at 3:30, went out at 4:15 on a line airplane pulled out of service.

He said they had four ASAP programs in addition to flight operations – load planning, dispatch, and two maintenance ones (union and non-union). He said an ASAP program for flight attendants was “percolating.”

When asked what the average monthly reports was for ASAP, he said they were in a downturn but were increasing in numbers dramatically – 1,833 for the year 2008. He said things had dropped off a bit this last quarter and thought it might have had to do with the Comair accident and the threat of release.

Mr. Carroll was asked if they had seen improvements across the audits after four major LOSAs, he said the observers were getting more skilled and one of the biggest successes from LOSA had been decreases in unstabilized approaches. They had had observations through history and the LOSA observations helped them sell the unstabilized approach focus. He said they developed new stabilized approach criteria and LOSA was an invaluable program because it gave them a human observation by a nonthreatening individual.

Asked how he saw SMS [Safety Management Systems] affecting what they were already doing or if it would change it, he said yes and he was instrumental in bringing it to CAL. He said Jim Stuart at ALPA and of ISASI [International Society of Air Safety Investigators] was really into SMS, visited carriers, and invited a number of management people. Mr. Carroll said he was the only one that showed up. In very easy terms, he said SMS applying structure to safety management, “if you have a good safety program you’re there.” He said he was told by Jim Stuart that CAL was 90 percent there with SMS and the 10 percent was the buyoff of the accountable executives and that was not there. He said his new boss at the time, Mr. Gunther took everything Mr. Carroll brought back and ran with it and did an outstanding job. He got the buy-in from upper management.

He said the most important thing they were seeing now was that they had to have a more robust database. They had appropriated over a million dollars to develop a mega-database to be on top of the data coming in from everywhere – occupational stuff, ground, etc. – one gigantic database. He said they had found a vendor they were going to use, and said they were going to do a better job of integrating a massive database so things could talk to each other. It was very expensive, tough to do in times like this, but they were doing it because there was a commitment to follow through. SMS had a program for an SMS model and they volunteered to do a gap analysis. They were into the SMS game, but Mr. Carroll considered it just good safety management, let the data tell them where their problems were and have support of executives to fix them. He said the CEO and president of the company even knew his name.

He said since he joined CAL he had different titles through the years. He had worked in flight safety the whole time he had been with the company. He considered himself a safety professional and had turned down offers to be a pilot or have mixed duties.

Asked about keyword searches he did on different types of reports, and whether he was able to search on other kinds of safety issues related to the Denver accident, such as how they worked with the air traffic system such as flow control, configuration decision making, Mr. Carroll said that it would have been nice if the accident crew had taken off on runway 25, but then again, the winds the crew were given were non-threatening.

Asked if there was a way to drill in on such issues in the safety databases, Mr. Carroll said he talked to John Bauer and asked if there were observations of any unusual control inputs during the LOSA. They were discreetly having a collaborative look into the data to try and find out. Mr. Carroll thought that if they had to think about doing certain things it would be nice to do some supporting stuff on that. He said they knew on the FOQA data that they were able to back into it and found some outliers that surprised them.

He said he had not thought about looking at ASAP dispatch or load planning because he did not know how to tell them to search their database.