



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Washington, D.C. 20594

March 26, 2020

Attachment 1 – Flight Crew Interview Summaries and Statements

OPERATIONAL FACTORS

DCA16LA100

Interviewee: Nathan K Hodges, Trans States EMB145 First Officer
Date and Time: March 3, 2016, 1003 CST¹
Location: via teleconference
Present: Shawn Etcher, David Lawrence – National Transportation Safety Board (NTSB); Normand Bissonnette – Federal Aviation Administration (FAA); Stuart Scott – Trans States Airlines (TSA); Mike Woodbury – Airline Pilots Association (ALPA)

First Officer Hodges was represented by Neal Davis, ALPA legal, labor relations counsel for TSA pilots.

During the interview, First Officer Hodges stated the following information:

His name was Nathan Kyle Hodges. He was 24 years old and was a first officer in the EMB145 based in St. Louis (STL). He was hired at TSA on June 15, 2015 and was a line pilot, not on reserve. He had been holding a line for about 2 or more months. He has always been based at STL.

He held an Airline Transport Pilot certificate for multiengine and a commercial single-engine certificate, and a certificated flight instructor (CFI) and multiengine instructor (MEI) certificates. His total flight was about 1850 hours and about 300 of those hours were in the EMB145. He held a 1st class medical certificate with limitation that he must wear corrective lenses. He was wearing the lenses at the time of the event and they were regular glasses used for distance. The certificate was issued in the June of 2015.

His last check ride was in August 2015. He had received 2 line checks since then, the last line check was in February of 2016 and the other was in October of 2015. The line checks were random line checks for the captain that he was flying with at the time. He had never failed a check ride.

He was the pilot flying at the time of the event.

The trip was a 4-day trip and the event occurred at the end of the 4-day trip. He and the captain had been paired together for the entire 4-day trip.

He had never been involved in any other accidents or incidents.

He reported that his brother helped him get started in flying, he was a pilot as well. He began his flight training in 2010 at Illinois Aviation Academy, a Part 61 flight school near Chicago, Illinois. He then became a CFI for a year before going to Alaska where he flew in the bush for a year, and then he was hired at TSA. He had never been asked to leave nor had he ever been terminated from any of his previous employers.

His chain of command at TSA was that he reported to a regional chief pilot, who was under the main chief pilot, who would report to the director of operations. Both the regional chief pilot and main chief pilot are based in St. Louis. He felt the TSA was well staffed and had not held any other position at TSA.

¹ Central Standard Time – All times in this summary are in CST unless otherwise noted.

He had been junior manned to cover a trip in February 2016, which started as a 2-day trip that was extended for one additional day. He also had been junior manned one other time in November of 2015.

If there was a safety concern he could report it to the regional chief pilot or his union representative; however, he had not had to that. TSA did have ASAP (Aviation Safety Action Program) and FOQA (Flight Operations Quality Assurance) programs. TSA also had a website form called "I am concerned" where you could also report a safety concern. He had used ASAP and it was a well-liked program for the pilots. He had never felt any pressure to complete a flight assignment. He had refused a flight once before as the captain of the flight refused to fly the airplane assigned. They notified the chief pilot of their refusal and that was all.

TSA does have dispatchers; however, he did not know how many dispatchers they had. If he needed to contact a dispatcher, he could do so via the telephone number that was listed on the dispatch release for a flight. While enroute they could contact dispatch through ACARS by sending the message through their flight management system. For the accident flight, they did not contact their dispatcher enroute; they contacted him when they were already on the ground. He had not interacted with their dispatcher previously.

The dispatch release provides information about the flight, weather, performance data, NOTAMs, weight information. He felt that the dispatch releases were pretty accurate; however, for the accident flight he could not recall the forecast winds for STL that was on the dispatch release.

The origination airport was Chicago O'Hare International Airport (ORD), Chicago, Illinois and he conducted the preflight. He did not notice any damage during that preflight walk-around. STL was the intended destination. He had landed at STL about 25-35 other times. The accident flight was the first time into STL that day. The flight departed ORD on-time, maybe a little early; but, could not remember the exact departure time. It was the last left of the trip for the crew. They came on duty in Louisville, Kentucky at 1400 EST². The accident airplane's ship number was 856 and there was no one in the cockpit jumpseat on the accident flight.

This trip was the first time he had flown with the accident captain. Their trip was a 4-day trip and there were 14 total legs [flight segments], one of those was a deadhead flight, and he flew 7 of those legs. The deadhead leg was on the 23rd of February. He felt the captain was easy to talk to and followed the procedures.

For the accident approach they decided to do a flaps 45 landing and adjusted the speed to match the standard operating procedures (SOP). The airplane was configured at 1,900 feet above ground level (agl). The before landing checklist was complete. The airspeed had a loss and gain of about 5 knots between 1,300 and 1,700 feet agl. The approach was stabilized prior to 1,000 feet agl. About 100 agl he began to input a crosswind correction utilizing left rudder and right aileron. The crosswind was from the right. At the 20 foot call he began to bring the engine thrust to idle and noticed that he had full right aileron stop correction. The airplane began to roll to the left and he had pitched the aircraft to about 3 or 4 degrees for the landing flare. He utilized left rudder input

² Eastern Standard Time

to maintain longitudinal axis parallel to the runway and full right aileron. He felt the airplane roll to the left. He decided to go-around and began the go-around procedures. He applied max thrust, pitched the nose of the airplane down so as to not stall, and applied right rudder to bring the nose back to our direction of movement. Full right aileron was still being used. As the engines spoiled up the flight controls had more effectiveness we began turning to the right but we quickly recovered. We performed the go-around procedures. After the airplane reached acceleration height the airplane was cleaned up and we decided the captain should take the next landing attempt. He did not feel the airplane make physical contact with anything. They then flew in the left traffic pattern for runway 30L and the second attempt concluded with an uneventful landing.

He described a stabilized approach as within our SOP, as plus or minus 5 knots on the planned speed, a descent or vertical speed of plus or minus 300 feet per minute (fpm) off the planned vertical speed and no more than one-half dot laterally off the centerline. For the first approach they had planned for 700 fpm. The maximum vertical speed they are allowed is 1,000 fpm. The first approach was stabilized about 3 to 5 miles from the runway and as best he could recall the airspeed was stable.

He felt that the workload did not interfere with his ability to focus on the approach and that the workload was the same on most of the approaches.

The approach was a visual approach backed up with the instrument landing system (ILS) to 30L. They were initially given 30R from approach control, when they were transferred to the tower controller they were offered 30L. We had the landing data for both 30L and 30R. He initially briefed the approach for 30R and conducted a second brief for the localizer to 30L. They were about 15 to 20 miles from the airport when they were transferred to the tower controller and conducted the brief for 30L. They did not have any concerns with landing on 30L or 30R, nor with the winds.

The airport had a crossing runway they could have request, which was runway 6/24; however, it was substantially smaller than 30L or 30R. The approaches to 30L or 30R were within their SOPs limits so they chose 30L. He did not recall if there were any noise abatement procedures for the runways.

He could not recall the landing weight or fuel on-board at the time of the event.

The pilot monitoring received the ATIS (automated terminal information system) through the ACARS; however, they both reviewed the weather. He recalled the wind was from 020 degrees at 20 knots gusting to 25 knots. The visibility was greater than 10 miles and they passed through a layer of clouds about 10,000 feet above mean sea level.

He had conducted landings with similar crosswind direction prior; however, he had not conducted landings with similar wind speed. Those landings were not at STL.

During training he was exposed to direct crosswinds at least once; however, he could not recall the wind speed during that training.

The procedures for conducting a crosswind landing was to establish a crab until around 50-100 feet agl, then execute a side slip maneuver utilizing the rudder to align the nose of the airplane with the runway, and utilize the ailerons to control the lateral movements. Landings are conducted by having the upwind wheel contact the runway first, then the downwind wheel, and maintain aileron control and input until the airplane comes to a slow movement to a stop. When he is the flying pilot, at 50 knots the controls are transferred to the captain, who would control the power levers, the tiller, and the rudder, while the FO would control the yoke. They do not utilize any extra airplane's systems during a crosswind landing.

The SOPs have windshear procedures which he offered and read from the SOP. The procedure included set max thrust, autopilot disconnected, and pitch to 10 degrees or as indicated by the command mode. When setting up for the approach make sure that you are stabilized no later than 1,000 feet agl and that you should consider using the longest suitable runway. They can increase the approach speed up to a maximum of an addition 20 knots. He stated that this speed is added to the calculated approach speed based upon weight.

He could not recall what the approach speed was. They did add a "substantial" amount of speed, around 15 to 20 knots, which they had included in the approach briefing. When they were over the runway they were around the approach speed they briefed, which was V_{ref} plus the additional speed.

During gusty wind approaches they utilize standard callouts. If they encounter windshear the callouts are the memory items. Also they are to make a localizer callout out if going off the localizer. Other standard callouts include the 1,000 feet agl and 20 feet agl. They made standard callouts during the approach.

He had hand flown the approach and utilized the flight director, which were on for both pilots. He disconnected the yaw damper about 300 feet agl, which was the normal procedure. There were no aural alerts before, during, or after the event.

The visual cue that he has if the airplane is approaching a stall is a "high pitch" attitude; and the indicator on the PFD, otherwise there is no visual cue. The normal pitch view during the landing is about 4 degrees nose up.

The runway lights for both runway 30L and 30R were illuminated and were set to about a medium intensity setting. He could not recall if 30L had a VASI (vertical approach slope indicator) or a PAPI (precision approach path indicator). When asked if he saw any vertical lights on the way in, he stated yes. He thought the lights "looked perfect."

They briefed flaps 45, which is the normal flap setting for landing. They can utilize flaps 22 if the approach speed exceeds the structural limit for flaps 45 in the SOPs. The flaps have no effect on the crosswind limitation. He has landed utilize flaps 22 prior but felt utilized flaps 45 more.

They have the ability to obtain the approach speed for both flaps 22 and flaps 45 via ACARS. They also have a chart in the flight deck.

When asked if the thrust levers ever were at idle, he stated yes. During the go-around he advanced the thrust levers to max and the captain "pulled them back." He could not remember the exact time when the captain retarded the throttles but it was "right after I advanced them." At that time they were still close to the ground. He could not recall if the captain retarded the thrust levers to idle; however, he (the FO) pushed them forward. There was no positive transfer of control between him and the captain and he never let go of the controls. He was not sure if they both were on the controls at the same time or not.

TSA provides suggested times when to conduct a go-around, but they have a no-fault go-around policy. He could not recall specifically when they were to go-around but at a minimum they were if there was windshear or if the airplane was at minimums. He could not recall any others.

The EMB145 has a maximum demonstrated crosswind of 30 knots and he thought that was the same limit in the SOP. He did not have a personal crosswind limit but 30 knots has been a limit for him.

Either crew member could command a go-around. The procedure for a go-around was to announce the go-around and then do the memory items, which included set max thrust, flaps 9 and smoothly bring the airplane up to the go around attitude in the flight director and push the GA buttons. He recalled commanding a go-around but nothing else, and then complying with the windshear procedures and trying to get the airplane out of the situation we were in. There was no windshear alert during the approach or go-around and the EMB145 has an aural windshear alert.

Following the go-around there were no alerts from the airplane; however, sometime during the event, the tower issued a change of winds to 030 degrees at 25 knots with gusts to 30 knots, as he could recall.

They flew left traffic for runway 30L, neither crew member suggested runway 06. They did not have to perform any emergency checklist and there is no balked landing checklist.

During the 4-day trip the captain followed the procedures in their SOPs. The CA always called for the checklists.

He was given a drug and alcohol test on the 24th around 1030 at the TSA office. He was not sure of the results but he has not received any calls.

His date of hire was the day he started training June 2105. He felt that the training encompassed everything that he has encountered. He finished his training, with his initial operating experience (IOE) in October of 2015. He has not had recurrent training. He could not recall the exact number of hours he flew during IOE but was sure it was more than 25 flight hours. He had 2 IOE check airman during his training and felt that they were very helpful. He could not recall any of the weather that he encountered during IOE but was sure there were crosswinds. TSA has a 15 knot crosswind limit for first officers during their first 100 hours of operating experience in the EMB145.

TSA does have different models of the EMB145 and they are given difference training for the XR model. The training is on the use of flaps 18 which was not available on any other EMB145 model in the TSA fleet. He stated that flaps 18 are an added flap setting not on the other models. He stated that TSA has an AQP.

He felt that crew resources management (CRM) training was adequate. It was accomplished during initial ground school and was about a day in length. He felt it was better than any other CRM course he had been given in the past.

On the day of the event, fourth day of their trip, their duty day stated at 1405 EST. He woke up at 0900 EST in Louisville and from the time he woke up until their duty day started he had breakfast, ran 2 miles, did some work on his computer, ate lunch, and then got ready for work. Their schedule for that day included deadheading from Louisville (SDF), Kentucky to Washington Dulles (IAD). Then operating the flight from IAD to Grand Rapids, Michigan (GRR), then operating the flight from GRR to ORD, and then the accident flight which was ORD to STL. Their projected end to the duty day was 0006.

Normally he wakes up around 0700. Prior to reporting for duty, he had a turkey and cheese wrap. During the duty time he had some nuts, applesauce, humus and pita chips, humus and cheese wrap for dinner, and two cookies.

The day prior to the event, third day of the trip, they started their duty day at 1450L at Houston Intercontinental Airport (IAH), Houston, Texas and end at SDF 2244L. He woke up at 0900 and classified his sleep as "great." That duty day they flew 3 legs, the first two legs were a round trip from IAH to Corpus Christi (CRP), Texas and back to IAH and the third leg was from IAH to SDF. Prior to his report he did similar things as he did prior to his report on the day of the accident.

Normally it takes him about 20 minutes to fall asleep when he goes to bed.

On the second day of the trip, they started in SDF with a show time of 0715 EST and their duty day ended at 1328L in IAH. That day they operated the flights from SDF to IAH, and a round trip from IAH to Shreveport (SHV), Louisiana.

The first day of the trip began with a show time in STL at 0736L and the completed their duty day at 1857 EST. They operated 4 flights that day and they were STL to ORD, ORD to Syracuse (SYR), New York, SYR to IAD, and the fourth leg was IAD to SDF. He felt that 3 to 4 flight legs were normal for him. He woke up at 0500 on the first day of the trip and that he felt his body adapts really well to waking up early.

Prior to the first day of the trip he had 2 days off and he golfed on those days. Contractually pilots are given a minimum of 11 days off every month; however, a pilot can waive some of those.

When he reported for the trip on the first day he felt rested and considered his health as average and has had no changes in his health in the previous year. TSA does have a sick call policy and that the pilots are allowed to call in sick. He has heard that a pilot maybe requested to provide a doctor's not; however, he has not had to call in sick since he started at TSA. He does not take in

prescription or non-prescription medication and had no changes in his personal life in the previous year.

He felt that a normal landing distance in the EMB145 would be between 4,000 and 5,000 feet. He has never landed on runway 6 at STL. He could not recall any restrictions that would prevent a flight from landing on runway 6.

He briefed the approach based on the ATIS information and he and the captain discussed about having a crosswind. ATIS did not offer an option for runway 6 and only offered runways 29, 30L, and 30R. He was not certain but thought runway 24 may have been option. He did not offer an option to the captain for runway 6, nor any concern about the winds. He did query the captain about utilizing flaps 22; however, decided to use flaps 45. He queried the use of flaps 22 as it would have provided them a faster Vref speed.

The SOPs do not list a difference between the flap settings as windshear mitigation strategies.

He did not hear any other aircraft or the control tower mention anything about windshear prior to conducting the approach.

He felt that since there was only a 20 degree difference in wind direction between using runway 30L and runway 6 that they chose the longest runway as the better option.

The EMB145 does have a predictive windshear system and it was not predicated on the weather radar being utilized nor does the radar predict possible windshear. He did not have the radar on. He normally would not turn on the radar with an overcast sky or if possible windshear.

He disconnected the autopilot prior to 1,000 feet agl; however, could not recall exactly when he disconnected it.

He initiated the go-around procedure but he conducted a windshear escape maneuver in order to get out of the situation the airplane was in. If a windshear warning had come on the flight director would pitch to 10 degrees and the pilot would follow the command bars on the flight director. He was not able to recall what the flight director was commanding when he pressed the go-around buttons.

Could not recall if the captain announced why he retarded the thrust levers. They did talk about it at the gate, and the captain said that they made the right decision to go-around but did not indicate what his intent was for reducing the thrust levers.

TSA does not provide transfer of control at low altitude training.

The procedure for a positive transfer of control is if the captain is taking control, the captain would state "my aircraft" and the first officer would repeat "your aircraft." He does not recall hearing the positive transfer and remembered transferring controls to the captain around 1,000 feet after the go around and we were cleaned up. When they transferred control at a 1,000 feet he recalls saying to the captain "your controls" and the captain replied "my aircraft" and he repeated to the captain

"your aircraft." It was his decision to transfer control to the captain as he felt it was the safest thing to do given the situation.

Prior to him having 100 flight hours in the EMB145 he had a crosswind restriction but after achieving 100 flight hours that restriction was removed.

During the 4-day trip him and the captain alternated legs as to who was the pilot flying.

At the beginning of the trip the captain had asked him how long he had been at TSA and he told the captain that he had been there less than a year.

When he operated in the bush in Alaska he flew the Cessna 207 and Casa212, which was a large twin turbo prop. He had flown about 600 total flight hours while in the Casa212 and had about 350 landings in the airplane, as a two person crew, and almost half of the landing had a crosswind in excess of 15 kts.

He has landed the EMB145 with close to a 24 knot crosswind prior. There was no windshear situation above the runway for that landing.

TSA does conduct windshear training in the simulator while flying an approach. Normally the windshear would occur, during training, about 200 feet agl and they would go-around by executing a windshear escape maneuver. Normally in the scenario the weather had ceilings around 1,000 feet agl and good visibility. There was also usually a pretty good crosswind and it was conducted during the daylight. There were only gusty wind conditions in the simulator and no lighting or thunder. The simulator did have an aural windshear alert. Windshear training was conducted in one simulator session.

He thought they encountered windshear on the first landing attempt, because he had full right aileron input and the airplane was doing something other than what he was commanding it to do. After the go-around he initiated a flaps 22 vice flaps 45 for the second approach and landing. He felt that it was a better option as the higher V-ref would help them as they were closer to the ground. They did add some speed to the flaps 22 approach speed.

TSA provides guidance that if there is a strong gusty wind that may exceed the flaps 45 structural speed limit then they are to utilize flaps 22. There are also abnormal and emergency procedures that would require the use of flaps 22.

He felt that he was rested for the last leg of the day and felt adequately rested during the trip.

Prior to conducting the second approach they calculated the approach speed for flaps 22. He also put in the gust factor which was 24 or 25 knots to the Vref speed which they retrieved from the ACARS, and there was no additional speed.

The performance numbers they utilized come from the ACARS after they obtain the weather from ATIS. They can put in the winds, temperature, flap setting, barometric setting, and braking conditions. ACARS will provide them with a minimum runway length, Vref speed, and Vfs speed.

Normally for flaps 45 the wind correction is one-half of the wind component and the entire gust. For flaps 45 it will always be 5 knots greater than Vref with a max allowance of up to 15 knots. If that speed would put them above the structural limit for flaps 45 than can reduce it by 5 knots. The structural limit speed for flaps 45 is 145 knots.

The windshear alert system automatically pitches the command bars on the flight director to 10 degrees if it recognizes the scenario. If it did not recognize the scenario then the flying pilot would press the go-around buttons, on the accident go-around he had to press the go-around buttons. If the system recognizes the windshear, you do not push the TOGA buttons.

During training they did conduct a low-level go-around at least two times. Typically it was conducted around 50 feet agl. He has not conducted a go-around in the EMB145, but he has conducted about 4 go-arounds in the past.

He could not recall how long it took them to fly from the go-around to the second approach. He did not feel pressed for time and was able to complete all of the checklists during that time.

He normally bids for 4-day trips.

He felt that the first approach was legal and that it was safe to conduct it.

The interview concluded at 1208.

Interviewee: Paul Kavanagh, Trans States EMB145 Captain
Date and Time: March 3, 2016, 1303 CST³
Location: via teleconference
Present: Shawn Etcher, David Lawrence – National Transportation Safety Board (NTSB); Normand Bissonnette – Federal Aviation Administration (FAA); Stuart Scott – Trans States Airlines (TSA); Mike Woodbury – Airline Pilots Association (ALPA)

Captain Kavanagh was represent by Neal Davis, ALPA legal, labor relations counsel for TSA pilots.

During the interview, Captain Kavanagh stated the following information:

He was Paul Kavanagh and he was 59 years old. He was a captain at TSA and was hired on February 1, 1991. His current base was St. Louis (STL) and during his career at TSA he had been temporarily assigned to bases at John F. Kennedy Airport in New York and Washington National Airport in Washington D.C. back in the mid-1990's.

He had an airline transport pilot certificate with type ratings in the ATR42, ATR72, BA4100, EMB120, EMB145, SA227, and the SF340. He started on the EMB145 in late 2002 and has not been a check airman at TSA. He had about 30,000 total hours of flight experience and about

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10,000 to 11,000 hours of that total flight experience was in the EMB145, all of which were pilot in command. He had been a captain since his first day at TSA, when they were bought by Air Midwest. He had a first-class medical certificate which included limits that he must wear glasses for distant vision and have corrective lenses for near vision. He was wearing his glasses the night of the event, and they were lineless bi-focal glasses. His medial was dated December 3, 2015.

His most recent check ride was conducted on February 15 and 16, 2016; it was a line oriented flight training (LOFT) (AQP). He could not remember his last line check. He had failed a checkride about 20 years prior, during his type rating for the ATR. It was a flapless landing, he meant to put the gear down and did a go-around but the checkride was over.

On the accident flight he was the pilot monitoring. The block time was 1:09 and the pairing was a 4-day trip. He and the first officer were paired together during the entire trip. He has had a few incidents during his career, hydraulic problems, engine out, but nothing in the recent past and no accidents.

He started flying at age 13 in England as part of the air training corps for the Royal Air Force. He soloed first in a glider in 1972, became a flight instructor in England. Came to the United States in 1981 and went to a flight school and converted his pilot's licenses to U.S. certificates. He was a certificated flight instructor in Tucson, Arizona for a year then flew freight for a year out of Wichita, Kansas. He was hired by Air Midwest to fly the Metroliner and was based out of Wichita, Kansas until 1987. Trans World Airlines moved the airplanes to STL at which time he moved to the St. Louis area. He flew the SF340 and then flew the EMB120 until Air Midwest was acquired by TSA. At that time he flew the EMB120, J4100 and the ATR. He had never been fired or terminated by any of his previous employers.

He reports to a regional flight manager, then the chief pilot, and then the director of flight operations. He feels they are very well staffed or reasonably staffed considering all of the transitioning that is occurring with all of the hiring going on in the industry. He has never had to cancel a flight for lack of crew. He has been reassigned to other flights. He has been junior manned, but that was a long time ago. He does volunteer for flights.

If there is a security issue he can bring it to the attention of the gate agent. If in flight he can relay any safety concerns to dispatch via ACARS or ARINC, if they are on the ground then he can call the dispatcher for that flight on the telephone number listed on that flight's dispatch release. They also have ASAP, FOQA, and incident reports as a well of communicating concerns. There was good communication with the company and there was no pressure to complete a flight. TSA does have a sick call policy and he has had to provide a doctor's note when he went on family medical leave (FMLA).

He was not sure how many dispatchers TSA has but thought it was probably at least a dozen. He did not talk the accident flight's dispatcher until after the flight.

Dispatch paperwork that they are provided includes their planned route of flight, the departure and arrival station, flight number, dates, fuel requirements, a breakdown of fuel burn, and alternate fuel, the crewmembers names, the dispatcher name, notes and weather. The weather at

STL included clouds above 5,000 feet mean sea level (msl), temperature in the mid 40's, and the big factor was the wind, which was out of the north to northeast at 15 knots gusting to 30 knots. He could not recall if there were any notes about the wind in the dispatch release but recalled seeing an arrival that they were not authorized to use. He felt that the dispatch paperwork and weather was accurate. He did not recall any special messages from dispatch regarding the winds.

The accident flight originated at Chicago O'Hare International Airport (ORD), Chicago, Illinois and the first officer performed the preflight prior to departure and did not report any damage. STL was their intended destination. The accident landing was the first landing they conducted at STL during the 4-day trip. Typically, he lands at STL about 6 times per month. The accident flight was on time and the departure time was 2225L. The accident flight was the last flight segment for the trip and following the trip his next trip would have been 2 or 3 days later.

The accident airplane was 856HK and they did not have a cockpit jumpseat rider on that flight segment. He had not flown with the first officer prior to this 4-day trip. He had done 7 landings during the 4-day trip and the first officer did 6 landings. He felt the first officer did very well during the 4 days and other landings had crosswinds but none were as strong as the accident flight's.

A stabilized approach was by 1,000 feet agl the aircraft must be on the glideslope, localizer, and at a set speed, no more than Ref+10. The SOPs also provide stable approach guidance. During the trip the first officer's approaches were all stabilized and during the accident flight it was stable. He could not recall specifics but he mentioned something about power at one point during the accident approach but considered it was a non-issue; the first officer said he did not want to stall. There were no real deviations but it seemed that the first officer was using a lot of power.

He did not feel like there was a high workload for the pilot monitoring on an average approach as he normally cross-checks the instruments.

During the accident approach they were initially cleared for runway 30R visual, after they changed to the tower frequency they were given, and accepted, runway 30L. The first officer briefed the approach for 30L; he had anticipated receiving 30L and had the performance numbers ready. The first officer was flying and they were stable around the MOIDD intersection. There was some comment about power, but he did not feel it an issue. During the landing flare, it happened quickly; while slipping into the wind, the first officer stated that he ran out of rudder and aileron. He observed some power changes but could not recall exactly when that occurred. There was a point during the flare where he thought they might be able to land on the runway, but he realized shortly after that the airplane was not able to land on the runway. He stated that it seemed as if the runway lights disappeared, so we went around. There was a great deal of turbulence but the aircraft was flying, and at the time the first officer was flying the airplane and he did not take over control from the first officer. He felt that the FO was the right man for the job as he had all the information ... After they performed a go-around, during the climb about 1,000 feet agl, the raised the flaps up and continued with the climb sequence. He asked the first officer how he was doing as the first officer was "shook up." At that point the first officer requested the captain take the next landing and that he had enough. He was willing to allow the first officer to fly the second approach had he wanted to and it would give him confidence, but

the first officer wanted him to take it. The tower asked what they wanted to do, and he stated to the first officer that they will do the visual approach. The first officer completed the required checklists. During the second approach and landing they utilized flaps 22 and the landing was uneventful.

During the first approach they were within the flaps speed for flaps 45 with the wind gusts and he like to able to put the aircraft on any runway and always elects for flaps 45. During the accident landing he thought that the aircraft speed and the wind gusts were too slow for the controls to give the slip into the wind and that was why they elected to utilize flaps 22 for the second landing. He stated that Flaps 22 was used because of his concern for the crosswind and flight controls.

He did not even think of landing on runway 6. At STL they habitually land on the 30's or the 12's. He has not landed on runway 6 in a long time and they are not offered runway 6. He has been offered runway 24 before but not runway 6. He thought that the air traffic control may have offered runway 6 to the airplane that was after them on the second approach but he could not recall for sure. He could not recall if another aircraft landed before his aircraft.

The approach briefing for the first approach was done "quite a ways out" and could have been completed shortly after the flight began its descent from the flight levels. He wants the approach brief completed early in case anything else comes up during the descent they have plenty of time. The first officer conducted that first briefing; however, they had to rebrief the approach from runway 30R to runway 30L. The original briefing was done after they had reviewed the current ATIS at STL. He thought the winds were similar to what he has seen before and thought that on the ATIS they were from 030 degrees at 25 knots. During the approach he thought the wind was more from 020 degrees at 20 knots. The ATIS did report a gust as well and he proffered that it was 20 knots gusting to 25 or 30 knots but could not recall exactly.

He recalled the first officer asking about flaps 22; however, he felt that since they were within their flaps 45 speed limitation that flaps 45 was allowable. They could have conducted the approach and landing with flaps 22 as that was allowed under the SOPs.

There are no special departure procedures out of STL when it comes to noise abatement procedures. He did recall a sign at the taxiway that intersects runway 30L mentioning noise abatement but nothing else. He was not sure if there was any noise abatement procedure for runway 6.

The landing weight for the first approach was about 38,000 pounds or so but he could not recall the exact landing weight number. The Vref for that weight was 121 knots and their approach speed was planned at 131 knots, due to the 10 knot add on factor for the crosswind. He stated that on the approach the airspeed remained fairly stable considering the winds.

The standard call outs on the approach were 1,000 feet above touchdown elevation and 20 feet agl. He stated that there were no special procedures for landing with the winds except for the airspeed additive. The first officer had hand flown the approach utilizing the flight director.

During the flare event he heard a triple chime; however, there was so much going on and he was looking outside at the time and did not observe what the warning message was. He was not aware of any stall warning or stick shaker. Once the aircraft was established in the climb, the triple chime was gone.

Their SOP provides windshear recovery procedures, which include set maximum thrust, pitch the airplane up to the command bars, about 10 degrees, while trying to stop the airplane from either stalling or overspeeding. The go-around procedures include set max thrust, retract the flaps to flaps 9, positive rate of climb gear-up, maintain heading, and then set approach climb. At 1,000 feet agl continue with the normal climb sequence. The night of the event they performed a go-around.

He could not recall who commanded the go-around, as it was "a confusing moment" but he thought they both said it as there was a verbal command. He thought he put his hands on the thrust levers as well as the first officer's hands. The first officer had his hands on the thrust levers prior to the go-around but had informed him that he [first officer] was running out of aileron and rudder. He could not recall for certain if the first officer had both hands on the control column prior to advancing the thrust levers to max thrust. For a split second he (the CA) thought they could land. The first officer had set max thrust and then he thought he had retarded the thrust levers after that and then advanced them back to max thrust. He took control of the airplane during the climb. He clarified that he [the captain] did bring the thrust levers back, at low altitude, as he thought they could have landed on the runway. He further stated that prior to the first application the thrust levers were "probably at idle" but could not recall for sure and did not think he brought them back to idle after the go-around was initiated.

He stated that that go-around was likely the lowest altitude, or closest to the ground he had ever initiated a go-around procedure. They are trained to go-around at low altitudes but the lowest he was given in training was about 50-100 feet agl. They receive windshear training and low-level go-around training at every recurrent training. Crew resource management (CRM) training was conducted every 9 months during ground school. It is more of a discussion and interaction between pilots and flight attendants. The training is not a full day. Early on CRM was more "play acting" but now it is more of discussion between crew members. He felt that there should be more flight attendant interaction. There is not a lot of difference with how he responds to a crew member now versus then. The training was taught by TSA. He felt the training was very good overall especially with the AQP, as it is easier to see examples instead of just a "straight checkride." He stated that considering some of the first officer's experiences when hired at TSA was a "big leap" to the EMB145 and he understands that some first officers may need extra training; however, when they begin flying the line they are just fine.

He commended the first officer for making the decision to go-around, and prior to their trip the first officer volunteered how long he had been with the company. He was diligent with a first officer he had never flown with prior, just as he was on this trip. The accident first officer, from the beginning of the trip, showed a lot of competence and handled the airplane well.

Prior to departure he generally lets the flight attendant know the time enroute and if there are any special considerations, as well as the serving conditions enroute. He had no concern on the

accident flight about turbulence enroute and released the flight attendant on climb out from ORD. They had 30 passengers on board the accident flight. During the flight from ORD to STL the flight attendant provided normal service to the passengers.

Their duty time for the day of the accident began at 1405 EST⁴ which was a deadhead flight from SDF to IAD. The deadhead flight was late; however, the original schedule had a break at ORD and the delay took up their break. They left ORD on time or maybe a little early.

The day prior to the accident, third day of the trip, began with almost 24 hours off in IAH. Their report time at IAH was 1450L and they flew a round-trip from IAH to CRP back to IAH and then from IAH to SDF. Their duty day ended at 2230L.

The second day of the trip began with a report time of 0750 EST at SDF. They flew from SDF to IAH and then a round-trip from IAH to SRV back to IAH.

The first day of the trip began at 0736L at STL. They flew from STL to ORD, ORD to SYR, SYR to IAD, and then IAD to SDF.

Prior to the trip he had 3 days off. Normally they are given 11 days off on "shorter" months and 12 days off on months that are 31 days in length. He normally bids for 4-day trips.

He takes vitamins and supplements and does not think he reports that on his first class medical.

The accident flight did not have an alternate filed for it, as the weather did not require one. However, if he wanted an alternate he could have requested one with his dispatcher.

The flap configuration for landing is based on the flap limiting speed; however, the SOPs allow the use of flaps 22. He normally uses flaps 22 if the speed on the approach was going to be greater than 145 knots.

Normally, when he is the pilot monitoring, he will obtain the ATIS weather information and type that information into their ACARS and the data will then be predicated on the weather information from the ATIS. For the accident flight he typed in the information and requested landing data for runway 30R as that was assigned to them, and printed it off. He then typed in the ATIS information, again for 30L, as he had anticipated a side step to runway 30L. At no time did he request the landing data for runway 6.

He could not recall if there were any windshear alerts on the first approach to runway 30L.

There was a crosswind limitation of 30 knots for the airplane.

A normal landing in the EMB145 will take about 3,000 feet of runway to land on. The minimum runway length they are required to have is 4,500 feet long. There are no restrictions for them to use runway 6.

⁴ Eastern Standard Time

He calculates the approach speed which includes one-half of the steady wind plus the entire gust factor, as reported on the ATIS. The maximum correction they are allowed is 15 knots and for the accident flight the maximum approach speed would have been 136 knots.

The triple chime warning they received was close to the ground; however, he could not speculate on the height above the runway as he was looking outside at the runway and not at the instruments. A triple chime is a warning message associated with items such as engine fire, battery overheat, etc. When he was able to look at the engine indicating and crew alerting system (EICAS) message it was gone and he was not sure what caused the triple chime alert, he was not certain if it had been canceled or not. A bank angle warning is also associated with the triple chime and included a red light on the glare shield as well as an EICAS message.

He had thought about being a checkairman or an instructor pilot a couple of times but he really enjoys flying and he has never been either.

He has had to take over the flight controls from a crewmember once or twice in the past but he could not recall when either of those times had occurred.

He did not feel he was fatigued at the time of the accident as he was well rested the night prior. Although the flight had a late arrival time he was used to the schedule and was a way of life.

He has encountered windshear in the past a couple of times but only as caution messages and went around.

He has been in turbulent conditions before but could not recall how severe the turbulence was in the EMB145.

The wind condition at the time of accident was from 020 degrees with wind gusts. The first officer did ask about flaps 22 prior to the approach and there was no discussion about windshear.

Normally the airplane's yaw damper is disconnected at 200 feet agl.

Either pilot could initiate a go-around once the go-around is started they are required to complete the go-around. Following the go-around they came back and did another approach to runway 30L which at STL they traditionally use the 30's and the 12's. He wished he would have utilized runway 6.

After they were parked at the gate the first officer inspected the airplane and immediately advised him of the damage to both wings. He also inspected the airplane after the first officer reported the damage.

During the accident sequence he could not recall audibly hearing a voice generated "bank angle" warning.

The triple chime was a master warning message.

The airplane's speeds come off the landing performance data provided by the ACARS. There is also a card in the cockpit as well, and the bottom of the card does provide information on how to perform the calculations and speed additions. They are trained to touchdown at Vref. TSA management had sent out a report about ref speeds as a recent safety notice. The notice provided guidance that flightcrews are to land at flaps 45. The reasoning for that was so flightcrews are not in a situation of landing the airplane at a speed any higher than they need to, as hydroplaning is an issue with the higher speeds.

During the approach he did recall observing the power a little higher than he wanted and did not want the first officer to "chase" his airspeed. The first officer stated to him that he "did not want to stall."

The 30 knot crosswind limitation was a "recommended" speed and there was no guidance saying it was a limit. He has conducted landings with a crosswind greater than 30 knots; however, once the wind approaches 40 knots that would be too much of a crosswind.

He was impressed with the first officer during the trip.

During the go-around they did not perform any abnormal checklists as there was no message on the EICAS for them to conduct a checklist for.

Once they were parked at the gate they did debrief the event; however, he could not recall what was discussed.

The interview concluded at 1610.

Crew Statement



Total Reports 1

Number [REDACTED]
Event Date/Time 2/23/2016 11:22 PM
Aware Date / Time 2/23/2016 11:45:00 PM
Recorded 2/24/2016 5:18:18 PM
Reporter Name [REDACTED]
Reporter Position [REDACTED]
Subject [REDACTED]
Aircraft Registration Archived\N856HK
Scheduled Departure Airport ORD - CHICAGO O'HARE INTL ARPT
Scheduled Arrival Airport STL - LAMBERT-ST LOUIS INTL ARPT
Landing Airport STL - LAMBERT-ST LOUIS INTL ARPT
Emergency Declared? No

Event Narrative

We had descended from our cruise altitude of FL220 to start our approach into STL. On the descent we encountered some continuous light chop, and some light icing conditions with no adverse problems. All ice cleared well before starting the approach. The descent to the airport was in the clear from something like 5,000 to 6,000 feet and the ride was smooth. Wind factor was figured in for the approach speed at flaps 45, Vref 121, Vapp 131, very little headwind factor, and was well within the flap speed limits, hence the choice to use flaps 45. We were cleared for the visual to 30R, then offered 30L, accepted, chart was loaded and ready for that. Briefed and stabilized before MOIDD. Remainder of approach was stable, and last wind reading from tower that I remember was 020/20. For the wind conditions all the way down the approach, it was remarkably smooth and stable. Then as the pilot flying flared to land and slip into the wind, he ran out of aileron and rudder authority to keep the aircraft from drifting toward the left side of the runway. Turbulence increased drastically within seconds. Positive and aggressive control and power inputs could not safely bring the aircraft back to the runway; a go-around was effected. At about 1,000 feet after climb sequence I took control of the aircraft, (the F/O was badly shaken) and did a visual pattern to landing using flaps 22 with the appropriate speed adjustments. Landing was uneventful. Once we got to the gate, I did announce to the passengers why we made the go-around. I also talked to the tower controller on the landline, and he informed me that he had to make a log book entry because of our close in go-around. Shortly after that the F/O came back from his post flight inspection and informed me of the damage to both wingtips and outer ailerons. I made entry in logbook and called maintenance, dispatch, and called tower controller again to inform him of our new findings. We waited for maintenance, talked to him, made a final call to dispatch to make sure nothing else had to be done from our end. Then we were released home.

Cause Narrative

Strong increase in crosswind during the flare.

Suggestions Narrative

Crew Statement



Total Reports 1

Number [REDACTED]
 Event Date/Time 2/23/2016 11:15 PM
 Aware Date / Time 2/23/2016 11:15:00 PM
 Recorded 2/24/2016 9:23:00 PM
 Reporter Name [REDACTED]
 Reporter Position [REDACTED]
 Subject Low Level Windshear/WingTip Strike
 Aircraft Registration Archived\N856HK
 Scheduled Departure Airport ORD - CHICAGO O'HARE INTL ARPT
 Scheduled Arrival Airport STL - LAMBERT-ST LOUIS INTL ARPT
 Landing Airport STL - LAMBERT-ST LOUIS INTL ARPT
 Emergency Declared? No

Event Narrative

On February 23rd, 2016 we were on a visual approach to runway 30L. The winds at the time of our landing clearance were 020 at 20 gusting to 25 knots. We decided to do flaps 45 and changed our approach speeds to legally coincide with our SOP. We became fully configured around 1900' AGL and the Before landing checklist was complete. Between 1300' AGL-1700' AGL I do remember going through a loss and gain of airspeed of +/- 5 knots, however, we became stabilized prior to reaching 1,000' AGL. From 1,000' AGL to 100' AGL the approach was stable. When we passed through 100' AGL I began the inputs of the crosswind correction. I applied Left rudder and right aileron for a crosswind from the right. At the 20 ft call I had the power at Idle, Pitch to 3-4 degrees, left rudder to the usefulness of maintaining the aircraft longitudinal axis parallel with the runway and full right aileron. The plane at this moment was slightly pitched up, Longitude axis was parallel with that of the runway and our upwind wing was slightly more down than the downwind wing. Then I felt the airplane starting to roll to the left, the nose was starting to yaw left and pitch up all at the same time. I felt some loss of control of the aircraft so I decided to Go Around. I placed the power in the Max Forward Thrust position. As the engines were spooling up I tried to pitch down enough where we would not stall, nor descend, and used right rudder to bring the nose back towards our direction of movement. Full Right aileron was still being used. I believed that since we started the Go Around Phase already, that a Go Around was our Best and Safest option so I placed the thrust levers back in Max Thrust Set position when the captain tried to bring them back. As the engines began to spool up control effectiveness was brought back to the ailerons and we began to turn to the right, which we quickly recovered. There was no thought or feeling of physical contact to the ground, wheels or wingtips. We performed the standard go around procedures. After Acceleration Height the airplane was cleaned up and we decided the captain should take controls. Somewhere throughout this event we heard tower issue a wind speed of 020 at 24 gust 30 knots. Abeam our landing point tower stated that winds were 020 20 gusting 24 knots. We did the in range checklist, got landing data for RWY 30L with flaps 22, and performed another approach with an uneventful landing. On the taxi in to the gate the tower asked us to give him a phone call upon reaching the gate. We complied and were told that he had to make a report for go arounds within 1/2 mile of the field so we told him we would also file an ASAP. When I performed my post flight, I saw both wing tips and a portion of the ailerons were hit but no other damage was found. I reported this immediately to the Captain and he called dispatch, maintenance, and the tower to report the incident as well. The numbers and data in this report are to the best of my recollection correct.

Cause Narrative

This event was caused by low level wind-shear.

Suggestions Narrative