# National Transportation Safety Board
# Aviation Accident Final Report

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| **Location:** | Cleveland, OH | **Accident Number:** | NYC03FA035 |
| **Date & Time:** | 01/06/2003, 1248 EST | **Registration:** | N16571 |
| **Aircraft:** | Embraer ERJ-145LR | **Aircraft Damage:** | Substantial |
| **Defining Event:** | | **Injuries:** | 50 None |
| **Flight Conducted Under:** | Part 121: Air Carrier - Scheduled | | |

## Analysis

The pilots initiated an approach to runway 6L, which was snow covered, and had a useable landing distance of 6,000 feet. The last winds from the tower were 340 degrees at 22 kts, with gusts to 35 knots. The maximum demonstrated crosswind for the airplane was 30 knots. The ATIS contained runway condition data that was 1 hour old. Inside the final approach fix, the captain elected to land with the wing flaps set at 22 degrees, rather than 45 degrees due to the wind. The Vref was adjusted to 138 kts, however, the final 38 seconds of flight was above 138 kts, and the final 7 seconds of flight was above 150 kts. In the final eight seconds of flight, the radar altimeter was less than 15 feet. However, the pilot continued with the landing and did not go-around. Touchdown occurred at an airspeed of 150 kts, about 1,523 feet from the departure end of the runway, and 2,308 feet from the ILS localizer antenna, which the airplane struck after it overran the runway. According to the company flight manual, with flaps set at 22 degrees, and a wet runway, the actual landing distance would have been 4,260 feet. When interviewed, the flight crew reported they had not checked landing distance. The FAA had published a NOTAM 26 days prior to the accident, which raised the landing minimums for the runway from 4,000 ft RVR to 5,000 ft RVR. The NOTAM was not in the airline's data base, and the company had no backup method for determining if they had all NOTAMS. The last RVR transmitted to the flight crew was 4,000 ft. The local controller did not update the flight crew with the latest RVR, or braking action reports as required. There was no requirement for the local controller to notify the pilots that the airport was below landing minimums even though the controllers were required to be aware of the approach minimums.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The captain's failure to attain a proper touchdown on runway, and his subsequent failure to perform a go-around, both of which resulted in a runway overrun. Factors were the company's inadequate dispatch procedures with their failure to provide all NOTAMS for the airport to the flight crew, and the snow covered runway.

## Findings

Occurrence #1: OVERRUN
Phase of Operation: LANDING - ROLL

Findings
1. (F) TERRAIN CONDITION - SNOW COVERED
2. (F) DISPATCH PROCEDURES - INADEQUATE - COMPANY/OPERATOR MANAGEMENT
3. (C) PROPER TOUCHDOWN POINT - NOT ATTAINED - PILOT IN COMMAND
4. (C) GO-AROUND - NOT PERFORMED - PILOT IN COMMAND
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Occurrence #2: ON GROUND/WATER COLLISION WITH OBJECT
Phase of Operation: LANDING - ROLL

Findings
5. OBJECT - ANTENNA

## Factual Information

HISTORY OF FLIGHT

On January 6, 2003, at 1248 eastern standard time, an Embraer ERJ-145LR, N16571, operated by ExpressJet Airlines, Inc., dba Continental Express as flight 2051, was substantially damaged when it overran the departure end of the runway while landing at Cleveland-Hopkins International Airport (CLE), Cleveland, Ohio. There were no injuries to the certificated airline transport pilot, and commercial rated pilot, flight attendant, and 47 passengers. Instrument meteorological conditions prevailed for the scheduled, domestic flight that last departed from Bradley International Airport (BDL), Windsor Locks, Connecticut. Flight 2051 was conducted on an instrument flight rules (IFR) flight plan under 14 CFR Part 121.

The flight sequence for the crew started at Cleveland. They flew the airplane to Windsor Locks, and then initiated the return trip to Cleveland. This was the first time the pilot and first officer had flown together. While on the ground at Windsor Locks, the captain received and signed the flight release. The flight release contained a computerized flight plan for the flight, and appropriate notices to airmen (NOTAMS), and weather. The designated alternate airport was Detroit Metropolitan Wayne County Airport (DTW), Detroit, Michigan.

The flight release showed a fuel load of 7,802 pounds, and the captain increased the fuel load to 8,100 pounds. According to the flight release, the computed fuel for the trip was 3,872 pounds with the remainder to be allocated to flight to alternate airport, reserve and contingency fuel.

Flight 2051 departed the gate at 1025, and was airborne at 1049. According to the flight crew, there were no problems with the en route or approach phases of the flight.

While being radar vectored for the approach, the runway visual range was given as 4,500 feet, and then 4,000 feet.

A review of the CVR revealed that the flight crew did not discuss runway conditions or the amount of runway required to land during the approach briefing, nor was it a requirement. The final runway visual range (RVR) given to the flight crew was 4,000 feet.

At 1241:30, the approach controller advised flight 2051 that their position was 9 miles from SASCO, cleared them for the approach to runway 6 L, and stated the RVR for the runway was 4,000 feet.

At 1242:40, approach control reported to the flight 2051, that they were at SASCO, and were instructed to switch frequencies to the control tower.

At 1244:40, the first officer reported the flight inbound from SASCO, and the control tower told the flight to continue with the approach.

At 1244:48, the first officer asked the captain if he wanted to be vectored back to the same runway in the event that they had to abandon the approach, or would he want to go to Detroit. The captain replied that they would proceed to Detroit.

At 1245:04, the tower controller cleared the flight to land, and stated that the winds were from 340 degrees at 22 knots, gusting to 35 knots. The flightcrew acknowledged the transmission.

At 1245:12, the captain stated that he was going to land the airplane with the 22-degree flap setting, and would add 5 knots to the reference speed. The first officer subsequently updated

the captain with a new reference speed of 138 knots. There was no discussion of runway conditions, or runway required to stop the airplane, nor was it required by the Continental Express Operating Manual.

At 1247:15, the CAWS alerted the flightcrew, "approaching minimums."

At 1247:21, the CAWS alerted the flightcrew, "minimums, minimums," followed by the captain asking the first officer, "see anything?" The first officer replied that she observed the approach lights in sight, and instructed the captain to "continue."

At 1247:26, the CAWS alerted the flightcrew that they were 200 feet above the ground.

At 1247:30, the captain stated that he had the runway environment in sight. The first officer replied, "no you're left."

At 1247:36, the CAWS alerted the flightcrew that they were 100 feet above the ground.

At 1247:44, the first officer stated, "dude, you might need to, need to get it down." The captain replied, "I know."

At 1247:54, the cockpit voice recorder recorded a sound similar to an airplane touching down on the runway.

At 1247:58, the cockpit voice recorder recorded a sound level increase, similar to engine reverse thrust being operated.

At 1248:01, the captain stated, "max reverse...it won't stop."

At 1248:05, the first officer said, "I got full brake."

At 1248:15, the cockpit voice recorder recorded the sound of an impact, followed 1 second later with the sound of the airplane coming to a stop.

At 1248:18, the first officer reported to the control tower, that flight 2051 had run off the departure end of the runway, and then the captain called for the rejected takeoff quick reference handbook (QRH), and evacuation checklist. The engines were shut down, and the airplane was secured. The passengers exited the airplane through the main cabin door, and were taken to the terminal via vehicles.

When interviewed, the captain reported that he had landed in similar conditions before. He picked up the flight release in operations and reviewed the material. He brought the departing fuel load up to 8,100 pounds. The minimum fuel to transit to the alternate airport was 3,100 pounds. He made the decision to conduct the landing with the flaps set at 22 degrees due to the winds. He did not seek any braking action report from the control tower. His contingency plan was to proceed direct to Detroit, if he could not land. He said the actual visibility was between 4,000 feet and 5,000 feet when he became visual. He could define the runway by the edge lights that were visible. However, the visibility was obstructed by snow blowing across the runway. Further, he reported that he did not experience any whiteout conditions, and that he maintained visual reference with the runway at all times during the landing. The touchdown speed was close to Vref. Upon touchdown, the speed brakes deployed, and he applied reverse thrust. There were no problems with directional control on the runway. The braking action was poor initially, and progressed to NIL during the rollout. He thought the airspeed was less than 60 knots as the airplane departed the runway. He reported that he considered a missed approach prior to hearing the aural warning for minimums and had visual reference with the

runway. He added that he would have executed a rejected landing if the airplane floated a lot.

When asked about landing distance, he said a rule of thumb for landing with the wing flaps set at 22 degrees, and a wet runway was 5,000 feet of runway required. He said he did not ask the first officer to compute the landing distance because he did not have the time to ask her to compute it.

The first officer reported that she reviewed the flight release, and computed the weight and balance. Initially there were no concerns about fuel, but as the trip progressed, fuel did become a concern. She remembered that they did not receive any braking action reports from the controllers. The captain raised the Vref speed by 5 knots due to the lesser flap setting, but not for the wind. She said that she did not compute a landing distance. There was no forward visibility on the approach; however, she could see the ground from about 1,000 feet. She described the runway condition as patches of snow in the beginning, and around taxiway Romeo, it changed to hard packed snow. The conditions then changed to snow and ice for the remainder of the runway. Overall, the runway conditions deteriorated as they moved down the runway.

The accident occurred during the hours of daylight at 41 degrees, 26.75 minutes north latitude, and 81 degrees, 50.55 minutes west longitude.

OTHER DAMAGE

The airplane struck the localizer antenna, and disabled it.

PERSONNEL INFORMATION

The captain held an airline transport pilot certificate with ratings for multi-engine land airplanes, and a type rating for the EMB-145. In addition, he held a commercial pilot certificate, with ratings for single engine land airplanes. He also held a flight instructor certificate with ratings for airplane single and multi-engine and instrument airplane. He was last issued a first class FAA airman medical certificate, with no limitations, on July 18, 2002. His last flight check occurred on August 20, 2002. The captain reported his total flight experience as 3,765 hours, with 661 hours in make and model, including 136 hours in the preceding 90 days.

The first officer held a commercial pilot certificate with ratings for single engine and multi-engine airplanes, and instrument airplane. She also held a flight instructor certificate with ratings for airplane single and multi-engine, and instrument airplane. She was last issued a first class FAA airman medical certificate, with no limitations on June 11, 2002. The first officer reported her total flight experience as 2,550 hours with 804 hours in make and model, including 194 hours in the preceding 90 days.

AIRCRAFT INFORMATION

The maximum demonstrated crosswind for the airplane was 30 knots.

METEOROLOGICAL INFORMATION

According to the METARS for Cleveland, snow started falling with the 2221 weather observation on January 5, 2003, and the winds were less than 10 knots. The snow was light and continued until the 1242 weather observation on January 6, 2003, when it increased to moderate snow. The winds continued at 10 knots or less, until the 1028 weather observation on January 6, 2003, when they increased above 10 knots and gusts were recorded.

The weather package for flight 2051, contained terminal forecasts. The terminal forecast for Cleveland was last amended at 0846 and the forecast for 1200 included winds from 340 at 12 knots, with gusts to 20 knots, overcast clouds at 2,500 feet, visibility 1 1/2 miles with light snow and mist.

En route, there were multiple updates to the Cleveland weather.

Cleveland Airport Information "Charlie" was current at the time of the accident and on initial contact the flight crew of BTA2051 advised the approach controller they had the current information.

At 1151, CLE ATIS Information "Charlie" broadcasted the following weather observation: wind 320 degrees at 15 knots, gusts to 25 knots; visibility 3/4 mile, light snow, blowing snow, mist; cloud conditions 900 feet broken, 1,600 feet overcast; temperature minus 2 degree Celsius; dew point minus 3 degree Celsius; altimeter 3007. ILS runway 6L approach was in use; landing runway 6L; runway 6R/24L closed; runway 6C/24C closed. All taxiways and ramps have 1-inch cover of snow. Braking action advisories are in effect. Braking action poor to fair by car. Caution advised runway 6R Tapley reading at 1456Z 60 60 60. Thin covered melted snow runway groom full length and width. Liquid chemical and sand applied 100 feet wide. Runway 6C Tapley reading at 1417Z, 60, 60, 60. Thin covered melted snow. Liquid chemical and sand applied 100 feet wide. Read back runway hold short instructions. Advise on initial contact you have Information "Charlie."

The 1242 Special observation included, winds from 330 degrees at 19 knots, with gusts to 29 knots, visibility 1/2 mile, snow, blowing snow, and mist, broken clouds at 1,100 feet, and overcast clouds at 1,600 feet, temperature -3 C, dewpoint -4 C.

The 1251 Special observation included, winds from 330 degrees at 17 knots, with gusts to 29 knots, visibility 1/2 mile, snow, blowing snow, mist, few clouds at 700 feet AGL, overcast clouds at 1,300 feet, temperature -4 C, dewpoint -4 C.

AIRDROME INFORMATION

Cleveland-Hopkins airport was certificated under 14 CFR Part 139. According to a representative of the Airport Division, in the FAA Great Lakes regional office, runway 6L was 6,800 feet long, and the landing distance available was 6,000 feet. On the departure end of runway 6L, there was an additional 270 feet of asphalt that terminated with the end of the runway and was not approved for landing roll. The ILS localizer antenna was located 515 feet beyond the physical end of the runway. The last 2,000 feet of runway had amber runway lights, and the end of the runway was defined by red lights.

FLIGHT RECORDERS

The cockpit voice recorder CVR contained usable information, and a transcript was prepared by the cockpit voice recorder group.

According to the flight data recorder, on final approach, localizer deviations remained under 0.1 dot until after touchdown. Deviations on the localizer remained under 0.1 dot until 23 seconds prior to touchdown, as the airplane passed through a pressure altitude of 852 feet. In addition for the last 38 seconds of flight, the airspeed was above 138 knots, and in the final 7 seconds, it was above 150 knots. In the final 8 seconds of flight, the airplane radar altitude was

15 feet or less. The air/ground squat switch on the main landing gear transitioned from air to ground when the airplane was about 0.38 nm (2,308 feet) from the ILS DME antenna, and 1,523 feet from the departure end of the runway, with an indicated airspeed of about 150 knots (KIAS). At that time, the winds were from 325 degrees at 23 knots. Also, at the same time that the main landing gear squat switch transitioned to ground, the spoilers deployed. Three seconds after touchdown, the thrust reversers were deployed. At that time the airplane was traveling at a speed of 140 KIAS, and was about 790 feet from the end of the runway. About 9 seconds after touchdown, the airplane was about 0.13 nm (790 feet) from the ILS DME antenna, and the airspeed was about 100 KIAS.

WRECKAGE AND IMPACT INFORMATION

According to an inspector from the FAA, the airplane struck the localizer antenna. The tail of the airplane was abeam of the localizer antenna. In addition, the nose landing gear had collapsed rearward and deformed the forward pressure bulkhead. Minor damage in the form of scrapes were found on the leading edge of both wings.

The brakes were checked after the accident and found to be within serviceable limits.

MEDICAL AND PATHOLOGICAL INFORMATION

Toxicological testing was conducted on the flight crew in accordance with the operator's procedures. The results were negative for drugs and alcohol.

ADDITIONAL INFORMATION

Instrument Approach Procedure Chart

The pilots used Jeppesen instrument approach charts. The original chart issued for the ILS 6L approach listed a decision height of 250 feet, and visibility of 3/4 of a mile. On December 20, 2002, the chart was updated and runway visual range of 4,000 feet was added to procedure. This was the chart that the pilot's had in their possession, and used for their approach briefing. However, a later chart had been issued with an effective date of January 3, 2003. The pilots did not have the latest charts in their possession when they performed the instrument approach. There was no change in landing minimums with the latest chart.

NOTAM Data

According to a Safety Board air traffic specialist, on December 11, 2002, NOTAM 2/2796 was issued as an FDC NOTAM by FAA Aviation Systems Standards, National Flight Procedures Office, AVN-100 and transmitted by the United States NOTAM Office (USNOF). NOTAM 2/2796 increased the visibility to RVR 5000 for all categories of aircraft on the ILS runway 6L at the Cleveland-Hopkins International Airport.

On January 3, 2002 NOTAM 2/2796 was canceled and replaced with NOTAM 3/0838. This NOTAM made the changes in the visibility minimums on the ILS runway 6L permanent. The NOTAM was reclassified as permanent, to be included in the next publication of the NTAP. Until that time the change was disseminated via the telecommunication system.

Continental Express received NOTAMs through their weather service provider, Electronic Data Systems, Inc (EDS). EDS provided terminal weather services, gathered from multiple governmental sources, and distributed the information through their fight planning system. The system maintained [computer] addresses of multiple airlines from around the world in a centralized database that is accessed through the individual airlines' telecommunications

networks.

Representatives from Continental Express advised the NTSB that they had not received FDC NOTAM 2/2796 and 3/0838.

The investigation revealed that their airline router address had been deleted from the EDS database. The reason was not determined. It was further discovered that this condition had existed since October 2002, and possibly as early as April 2002. Continental Express did not have a backup system in place to detect the missing NOTAM.

Cleveland Air Traffic Control Tower and Approach Control

The Safety Board air traffic control specialist reported that Cleveland Air Traffic Control Tower also received the NOTAM, and placed copies on the NOTAM clipboards in both the tower and radar rooms. All controllers were required to review these clipboards prior to the beginning of their shift. In addition, information contained in the NOTAM was disseminated as part of a mandatory facility-training item to all personnel who were required to review the material.

Although required to be aware of NOTAMS that affected their airport, the FAA did not have any requirement in place for a controller (approach or control tower) to advise a pilot that an approach was below published FAA minimums. In addition, there is no FAA requirement for a controller to deny a pilot an approach clearance when the approach is below published FAA minimum.

The last airplane to land on runway 6L prior to the accident flight was Continental Express flight 2017, which touched down about 1242. The pilot gave a braking action report of, "fair to poor." All previous braking action reports by pilots were given as fair. When the captain was interviewed, he reported that the visibility of the center line markings on the runway was marginal, and further stated that mostly he saw the runway edge lights. He added that the left side of the runway was covered with snow, ice, and blowing snow."

Flight 2017 was followed by Continental Airlines flight 525, a Boeing 737, which executed a missed approach at about 1244. The flight crew had been given winds from 340 degrees at 19 knots, with gusts to 29 knots. The controller advised the flight crew that braking action was fair.

The local controller did not provide flight 2051 with braking action reports or the current runway visual range.

Runway Friction Readings

According to the Aeronautical Information Manual, Section 4-3-9; Runway Friction Reports And Advisories:

"...MU (friction) values range from 0 to 100 where zero is the lowest friction value and 100 is the maximum friction value obtainable. For frozen contaminants on runway surfaces, a MU value of 40 or less is the level when the aircraft braking performance starts to deteriorate and directional control begins to be less responsive. The lower the MU value, the less effective braking performance becomes and the more difficult directional control becomes."

"Numerical readings may be obtained by using any FAA approved friction measuring device. As these devices do not provide equal numerical readings on contaminated surfaces, it is necessary to designate the type of friction measuring device used."

Cleveland Runway Data

At 1147, a local NOTAM was issued that runway 6L/24R was covered with thin wet snow. The runway had been "broomed" full length and width, and liquid deicer and sand had been applied to a width of 100 feet. "Tapley" readings at the touchdown, middle, and rollout zones of the runway measured 60, 60, and 60. There was no record of any further treatment or snow removal from the time the runway was opened, until after the accident. This local NOTAM was in effect at the time of the accident.

At 1259, after the accident, "Tapley" readings were taken on the runway. The readings varied between 25 and 30 on all sections of the runway.

Operations Manual

The following data was extracted from the Continental Express operations manual

Descent and Approach Planning

"Final selection of a runway and flap setting should include consideration of ATC flow, touchdown speed, available stopping distance, braking conditions, and go-around capability. As always, the judgment of the Captain is the final determining factor."

Landing

"When landing on slippery runways, do not allow the aircraft to float. A firm touchdown in the touchdown zone assures maximum braking effectiveness and adequate runway for stopping."

Two Engine ILS Approach

"Target airspeed will be maintained to an altitude approximate to begin slowing the aircraft to cross the threshold (50 FT) at Vref. Proper technique for landing is to touchdown in the touchdown landing area (1,000 ft. from the approach end of the runway)."

Contaminated Runway Definitions

"A contaminated runway is a runway where more than 25 percent of the required field length, within the width being used, is covered with a measurable depth of standing water, slush or wet snow that is 1/4 inch or greater or dry snow that is 2 inches or greater."

Runway Charts and Landing Distance

Continental Express published tabular landing distance charts for the EMB-145. The charts included landing distance required for flight planning purposes, and actual landing distance charts. They were available for landing with the wing flaps either set at 22 degrees, or 45 degrees. The charts carried a note to add 20 percent to the existing distance displayed for wet runway.

According to page 2-112 of the Flight Operations manual, wet or slippery runways should be anticipated with the following weather conditions.

Moderate or heavy rain.

Freezing rain of any intensity.

Moderate or heavy snow.

Light snow with surface temperatures above 28 degrees F.

Ice, snow, or slush remaining on the runways except for scattered patches.

With the wing flaps set at 22 degrees, and the weight of the airplane at 40,250 pounds, and operating on a dry runway, the airplane would have required 3,550 feet to stop. When the wet runway factor of 20 percent was added, the distance increased to 4,260 feet. These landing distances were predicated on crossing the runway threshold at 50 feet AGL, with the airspeed at Vref.

The airplane operating manual did not contain contaminated runway charts.

## Pilot Information

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| **Certificate:** | Airline Transport; Flight Instructor; Commercial | **Age:** | 31, Male |
| **Airplane Rating(s):** | Multi-engine Land; Single-engine Land | **Seat Occupied:** | Left |
| **Other Aircraft Rating(s):** | None | **Restraint Used:** | Seatbelt, Shoulder harness |
| **Instrument Rating(s):** | Airplane | **Second Pilot Present:** | Yes |
| **Instructor Rating(s):** | Airplane Multi-engine; Airplane Single-engine; Instrument Airplane | **Toxicology Performed:** | Yes |
| **Medical Certification:** | Class 1 Valid Medical--no waivers/lim. | **Last Medical Exam:** | 08/20/2002 |
| **Occupational Pilot:** | | **Last Flight Review or Equivalent:** | 08/20/2002 |
| **Flight Time:** | 3765 hours (Total, all aircraft), 661 hours (Total, this make and model), 2328 hours (Pilot In Command, all aircraft), 136 hours (Last 90 days, all aircraft), 49 hours (Last 30 days, all aircraft), 3 hours (Last 24 hours, all aircraft) | | |

## Co-Pilot Information

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| **Certificate:** | Flight Instructor; Commercial | **Age:** | 26, Male |
| **Airplane Rating(s):** | Multi-engine Land; Single-engine Land | **Seat Occupied:** | Right |
| **Other Aircraft Rating(s):** | None | **Restraint Used:** | Seatbelt, Shoulder harness |
| **Instrument Rating(s):** | Airplane | **Second Pilot Present:** | Yes |
| **Instructor Rating(s):** | Airplane Multi-engine; Airplane Single-engine; Instrument Airplane | **Toxicology Performed:** | Yes |
| **Medical Certification:** | Class 1 Valid Medical--no waivers/lim. | **Last Medical Exam:** | 06/12/2002 |
| **Occupational Pilot:** | | **Last Flight Review or Equivalent:** | 10/31/2002 |
| **Flight Time:** | 2550 hours (Total, all aircraft), 804 hours (Total, this make and model), 1150 hours (Pilot In Command, all aircraft), 194 hours (Last 90 days, all aircraft), 71 hours (Last 30 days, all aircraft), 3 hours (Last 24 hours, all aircraft) | | |

## Aircraft and Owner/Operator Information

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|---|---|---|---|
| **Aircraft Manufacturer:** | Embraer | **Registration:** | N16571 |
| **Model/Series:** | ERJ-145LR | **Aircraft Category:** | Airplane |
| **Year of Manufacture:** | | **Amateur Built:** | No |
| **Airworthiness Certificate:** | Transport | **Serial Number:** | 633 |
| **Landing Gear Type:** | Retractable - Tricycle | **Seats:** | 54 |
| **Date/Type of Last Inspection:** | 11/10/2002, Continuous Airworthiness | **Certified Max Gross Wt.:** | 48501 lbs |
| **Time Since Last Inspection:** | 378.3 Hours | **Engines:** | 2 Turbo Fan |
| **Airframe Total Time:** | 845.3 Hours | **Engine Manufacturer:** | Rolls-Royce |
| **ELT:** | Installed, not activated | **Engine Model/Series:** | 3007-AIP |
| **Registered Owner:** | Wells Fargo Bank, Northwest NA Trustee | **Rated Power:** | 7850 lbs |
| **Operator:** | ExpressJet Airlines Inc. | **Air Carrier Operating Certificate:** | Flag carrier (121) |
| **Operator Does Business As:** | Continental Express | **Operator Designator Code:** | C2XA |

## Meteorological Information and Flight Plan

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| **Conditions at Accident Site:** | Instrument Conditions | **Condition of Light:** | Day |
| **Observation Facility, Elevation:** | CLE, 791 ft msl | **Observation Time:** | 1242 EST |
| **Distance from Accident Site:** | 0 Nautical Miles | **Direction from Accident Site:** | 0° |
| **Lowest Cloud Condition:** | | **Temperature/Dew Point:** | -3°C / -4°C |
| **Lowest Ceiling:** | Broken / 1100 ft agl | **Visibility** | 0.5 Miles |
| **Wind Speed/Gusts, Direction:** | 19 knots/ 29 knots, 330° | **Visibility (RVR):** | 4000 ft |
| **Altimeter Setting:** | 30.07 inches Hg | **Visibility (RVV):** | |
| **Precipitation and Obscuration:** | | | |
| **Departure Point:** | Windsor Locks, CT (BDL) | **Type of Flight Plan Filed:** | IFR |
| **Destination:** | Cleveland, OH (CLE) | **Type of Clearance:** | IFR |
| **Departure Time:** | 1025 EST | **Type of Airspace:** | Class B |

## Airport Information

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| **Airport:** | Cleveland-Hopkins Intl Arpt (CLE) | **Runway Surface Type:** | Asphalt |
| **Airport Elevation:** | 791 ft | **Runway Surface Condition:** | Snow--compacted; Snow--wet |
| **Runway Used:** | 6L | **IFR Approach:** | ILS |
| **Runway Length/Width:** | 6000 ft / 150 ft | **VFR Approach/Landing:** | None |

## Wreckage and Impact Information

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| **Crew Injuries:** | 3 None | **Aircraft Damage:** | Substantial |
| **Passenger Injuries:** | 47 None | **Aircraft Fire:** | None |
| **Ground Injuries:** | N/A | **Aircraft Explosion:** | None |
| **Total Injuries:** | 50 None | **Latitude, Longitude:** | 41.445833, -81.842500 |

## Administrative Information

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| **Investigator In Charge (IIC):** | Robert L Hancock | **Adopted Date:** | 06/02/2004 |
| **Additional Participating Persons:** | Leigh J White; Federal Aviation Administration; Cleveland, OH<br>Fred Junek; Continental Express; Houston, TX<br>Frank Pizzonia; ALPA; Herndon, VA<br>Paulo M Ribiero; Embrear Aircraft Co.; Ft. Lauderdale, FL | | |
| **Publish Date:** | | | |
| **Investigation Docket:** | NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at pubinq@ntsb.gov, or at 800-877-6799. Dockets released after this date are available at http://dms.ntsb.gov/pubdms/. | | |