


| | | | | | |
|--|--|-----------------------------------|----------------------------------|--------------------------------------|------------------|
|  | | NTSB ID: CHI04IA056 | | Aircraft Registration Number: N595SW | |
| | | Occurrence Date: 01/17/2004 | | Most Critical Injury: None | |
| | | Occurrence Type: Incident | | Investigated By: NTSB | |
| Location/Time | | | | | |
| Nearest City/Place Rapid City | | State SD | Zip Code 57701 | Local Time 2211 | Time Zone MST |
| Airport Proximity: On Airport/Airstrip | | Distance From Landing Facility: 0 | | | |
| Aircraft Information Summary | | | | | |
| Aircraft Manufacturer Bombardier | | Model/Series CL-600-2B19 | | Type of Aircraft Airplane | |
| Revenue Sightseeing Flight: No | | | Air Medical Transport Flight: No | | |
| Narrative | | | | | |
| Brief narrative statement of facts, conditions and circumstances pertinent to the accident/incident: | | | | | |
| HISTORY OF FLIGHT | | | | | |
| <p>On January 17, 2004, at about 2211 mountain standard time, a Bombardier CL-600-2B19, operated by Skywest Airlines, as flight 3855, contacted the runway with the left wing tip, while landing on runway 32 (8,701 feet by 150 feet, dry concrete) at the Rapid City Regional Airport (RAP), Rapid City, South Dakota. The airplane received minor damage to the wing tip. The captain, first officer, flight attendant, and 32 passengers were not injured. The 14 Code of Federal Regulations Part 121 scheduled passenger flight was operating in instrument meteorological conditions on an instrument flight rules (IFR) flight plan. The flight originated from Salt Lake City, Utah, at 2035.</p> | | | | | |
| <p>The captain reported that during their initial descent the RAP automated surface observing system (ASOS) was reporting the weather conditions as being clouds broken at 100 feet and overcast at 500 and 1 1/2 statute (sm) miles visibility. He stated the ASOS was also reporting that the ceiling was varying between 100 and 600 feet. He stated they set up for the instrument landing system (ILS) runway 32 approach and a few minutes later Ellsworth Approach Control reported the visibility had decreased to 1/2 mile in freezing fog. The captain stated that the controller asked them what their intentions were at which time they requested vectors for the approach.</p> | | | | | |
| <p>The captain stated that a minute or two later the controller reported the visibility decreased to 1/4 mile with freezing fog. He stated they informed the controller that due to the decreased visibility, they were unable to make the approach and they requested holding instructions. He stated they were issued a hold at the outer marker, RANCH. He stated that as they entered the hold, he switched radios and informed dispatch that they were going to be delayed. The captain stated that the first officer then informed him that Ellsworth approach control was now reporting the RAP visibility as being 1/2 mile. He stated they asked for and received vectors for the approach. He stated they were informed that the RAP tower was closed and they would be unable to receive runway visual range (RVR) information.</p> | | | | | |
| <p>The captain stated they turned on the auxiliary power unit (APU) and configured the bleed air system in anticipation of encountering icing conditions when they descended through the fog layer. He stated they were cleared for the approach and almost immediately upon entering the top of the fog layer they received an ICE caution message. He stated they turned on the wing and engine inlet anti-ice, but the ice accumulation on the windshield wipers was "quite rapid."</p> | | | | | |
| <p>The captain stated that as the approach progressed he became concerned about the amount of ice accumulating on the windshield wipers. He stated he looked out the side window and although he was unable to tell the quantity, he saw ice accumulating on the winglet. He stated that he then began calculating how much fuel they had remaining and how long they would be able to hold before continuing to their alternate.</p> | | | | | |
| FACTUAL REPORT - AVIATION | | | | | |

National Transportation Safety Board

FACTUAL REPORT

AVIATION

NTSB ID: CHI04IA056

Occurrence Date: 01/17/2004

Occurrence Type: Incident

Narrative (Continued)

The captain stated they continued the approach and the first officer called "500 to minimums." He stated that just above minimums the approach lights came into sight and he had the runway in sight at approximately 140 feet above the ground. The first officer then disconnected the autopilot at which time the nose came up slightly. He stated he informed the first officer to keep the nose down and add thrust. The captain stated they were slightly left of the centerline and the first officer was making "small" corrections back to the right. He stated the airspeed was just inside the "bottom of the bucket" and the trend vector was indicating a decrease in airspeed. He stated he "again said something about more thrust and keeping the nose down." He stated the airplane continued to move to the right of the centerline and he took control of the airplane. He stated the airplane responded "poorly" feeling "heavy and sluggish." The captain stated the airplane was close to the right side of the runway and he added thrust at which time the ailerons became more responsive. He stated the left wing dropped, scraping the runway, at about the same time the left main gear touched down. The captain stated the airplane bounced into the air then landed hard on the runway. The crew then taxied the airplane to the gate.

The first officer stated that when the captain reported having the runway in sight, she transitioned her sight outside of the airplane and realized she needed to correct "slightly (about a foot)" to the right. She stated she began the correction when the nose of the airplane pitched up, the airplane veered toward the correction, and it started sinking toward the right side of the runway. She stated the captain took over the controls, but the airplane dropped to the runway, bounced, and touched down harder the second time. She stated she believes the wingtip scraped the runway. The first officer stated that a post flight inspection of the airplane revealed "large amounts of 1/2 to 1 inch thick jagged mixed ice all along the vertical and horizontal stabilizer, as well as, up the leading edge of the wingtips and several silver dollar size balls of ice on the static wicks."

PERSONNEL INFORMATION

Information provided by SkyWest Airlines indicated the first officer, who was flying the approach, had approximately 15 hours of total flight time in a CL-600. The captain, who was also a check airman, had a total of 1,196 hours of flight time in a CL-600.

METEOROLOGICAL INFORMATION


The RAP weather recorded at 2142 was: wind 070 degrees at 7 knots, visibility 1 1/2 statute miles in mist; broken clouds at 100 feet, overcast clouds at 500 feet, temperature -1 degree Celsius, dew point -2 degrees Celsius, and altimeter 30.12 inches of Mercury (Hg).

The RAP weather recorded at 2152 was: wind 070 degrees at 7 knots, visibility 1/4 mile in freezing fog, vertical visibility 100 feet, temperature -1 degree Celsius, dew point -2 degrees Celsius, and altimeter 30.13 inches of Hg.

The RAP weather recorded at 2203 was: wind 080 degrees at 5 knots, visibility 1/2 mile in freezing fog; vertical visibility 100 feet, temperature -1 degree Celsius, dew point -2 degrees Celsius, and altimeter 30.13 inches of Hg.

The RAP weather recorded at 2211 was: wind 070 degrees at 6 knots, visibility 1/4 mile in freezing fog, vertical visibility 100 feet, temperature -2 degrees Celsius, dew point -2 degrees Celsius, and altimeter 30.13 inches of Hg.

The RAP weather recorded at 2242 was: wind 060 degrees at 8 knots, visibility 1 mile in mist, vertical visibility 200 feet, temperature -2 degrees Celsius, dew point -3 degrees Celsius, and altimeter 30.14 Hg.

| | |
|--|-----------------------------|
|  <p>National Transportation Safety Board FACTUAL REPORT AVIATION</p> | NTSB ID: CHI04IA056 |
| | Occurrence Date: 01/17/2004 |
| | Occurrence Type: Incident |

Narrative (Continued)

There were no current Severe Weather Alerts, Convective SIGMETs, SIGMETs, or Center Weather Advisories over RAP at the time of the incident.

A pilot who was flying a Piper PA-24-250 that landed at RAP 5 to 7 minutes prior to SkyWest 3855 stated the weather was changing rapidly during the evening. He stated that fog was rolling into and out of the airport. This pilot stated he began picking up a trace of ice when he entered the clouds during the approach. He stated the icing conditions worsened rapidly as he continued the descent. He stated the ceiling was about 1,000 feet and the visibility was about 6 miles when he touched down. The pilot stated he picked up so much ice on his airplane that it stalled 3-feet above the runway at an airspeed of 90 knots. He stated he heard SkyWest 3855 land as he approached his hangar on the north end of the airport; however, he was unable to see the airplane due to the rapidly decreasing visibility. This pilot stated that his airplane accumulated so much ice during the approach that the leading edge of the wings were no longer cambered, but rather they were flat due to the ice buildup. He stated he would not have been able to make a missed approach with the amount of ice that was on the airplane.

Several passengers provided written statements regarding the flight. They stated they were informed prior to takeoff that the weather conditions in RAP might warrant them having to divert to Casper, Wyoming. One passenger stated he was able to see ground light approximately 100 to 150 feet prior to landing. Other passengers stated they were unable to see any lights prior to the airplane contacting the runway.

COMMUNICATIONS

The air traffic control tower at RAP closed at 2200. The approach control facility at Ellsworth Air Force Base was also scheduled to close at 2200; however, the chief controller stated they stayed open because of the traffic going into RAP.

At 2148:37, Skywest 3855 contacted the Ellsworth Approach Control reporting they were descending out of 22,500 feet for 17,000 feet. The controller responded that they were cleared to descend to 10,000 feet and that the weather at RAP was: wind zero six zero at six, ceiling one hundred broken, five hundred overcast, visibility one half mile with freezing fog.

At 2151:37, the Ellsworth controller contacted the RAP tower and requested their visibility to which the RAP tower controller replied that it was one-half mile.


At 2153:54, the controller transmitted, "Attention all aircraft, Rapid weather now reports indefinite ceiling at one hundred, visibility one quarter."

At 2154:24, Skywest 3855 was cleared to descend and maintain 7,000 feet. Skywest 3855 acknowledged the instruction and asked the controller to repeat the weather. The controller repeated the weather information adding that there was freezing fog. Skywest 3855 replied that they were going to have to hold because they could not accept the approach with one quarter mile visibility. The controller then issued holding instructions.

At 2156:22, the approach controller transmitted that the runway 32 RVR was 1,600 feet.

At 2158:27, the approach controller transmitted that the RAP visibility was one half mile with an indefinite ceiling at 100 feet. Skywest 3855 verified the visibility with the controller and stated that as long as the RVR stayed above 2,400 feet or the visibility stayed above half a mile they could fly the approach.

At 2159:02, the controller issued vectors for the approach and informed Skywest 3855 that the RAP tower was closed so they would not be able to get RVR information. Skywest 3855 acknowledged the information.

| | |
|--|-----------------------------|
|  <p>National Transportation Safety Board FACTUAL REPORT AVIATION</p> | NTSB ID: CHI04IA056 |
| | Occurrence Date: 01/17/2004 |
| | Occurrence Type: Incident |

Narrative (Continued)

The controller continued to issue vectors for the approach and at 2204:53, Skywest 3855 was cleared for the ILS runway 32 approach.

At 2208:18, the controller transmitted, "Rapid City weather now reports visibility one quarter."

Another airplane that had just landed at RAP issued a pilot report stating their airplane had picked up one half inch of ice and that the visibility was one half mile. The controller asked Skywest 3855 if they heard the pilot report. Skywest 3855 replied that they had and that they experienced moderate mixed icing at 4,700 feet.

At 2213:19, Skywest 3855 transmitted that they were canceling their IFR.

FLIGHT RECORDERS


The cockpit voice recorder was removed from the airplane and sent to the National Transportation Safety Board (NTSB) Vehicle Recorder Laboratory in Washington, D.C. for inspection. Information retrieved from the cockpit voice recorder was not pertinent to the incident.

The flight data recorder contained approximately 50 hours of data. The incident flight was the last flight recorded and its duration was about 1 hour and 22 minutes. The data showed the airplane descending on the approach with the flaps fully extended, and with the wing and cowl anti-ice systems activated. At subframe reference number (SRN) 53777, the autopilot was disengaged at which time the airplane rolled slightly to the left followed by a 9-degree roll to the right. The magnetic heading continued to change reaching 331 degrees at SRN 53790. Four seconds later the weight on wheels (WOW) parameter changed from air to ground for both main landing gears. At this time the magnetic heading was recorded as being 326 degrees and the vertical acceleration reached at least 1.8g's. One second later, the WOW parameter indicated both main gear were airborne, the airplane was in a 16-degree left bank, the pitch measured 5 degrees up, and the power on both engines was increasing. At SRN 53799, the data showed the ground and flight spoilers deployed. One second later the WOW parameter switched to ground, and the vertical acceleration was recorded as 3.25g's. The WOW for the nose gear then indicated airborne for one second prior to returning to ground. The spoilerons showed activation followed by the thrust reversers deploying at SRN 53806. The data then shows the airplane taxiing.

WRECKAGE AND IMPACT INFORMATION

A post incident inspection of the airplane was conducted by an inspector from the Federal Aviation Administration (FAA) Flight Standards District Office (FSDO) in Rapid City, South Dakota. The inspection was conducted at about 1430 on January 18, 2004, the afternoon following the incident. The inspector reported the damage to the airplane consisted of a 3-inch wide by 10-inch long scrape on the bottom of the left wing tip, a portion of which was worn down to the underlying aluminum structure. The inspector also reported that ice was visible on some of the unprotected areas of the airplane such as the antennas, windshield wipers, radome, winglets, and horizontal and vertical stabilizers. The inspector reported that the main body of ice on these structures measured between one-half and five-eighths of an inch thick and that the main body of ice plus the "ice spines" totaled three-quarters of an inch thick. The outside air temperature varied between -2 degrees Celsius and -6 degrees Celsius between the time of the incident and the time of the inspection.

The FSDO inspector reported that an inspection of the runway revealed initial tire marks were visible 1,976 feet from the approach end of the runway. The tire mark corresponding to the left main gear was located on the runway approximately nine feet from the right edge of the runway. The mark corresponding to the right main gear was located in the grass about two to three feet off the right side of the runway. A scrape mark which began 2,262 feet from the approach end of the runway was visible on the pavement. This scrape mark was 63 feet long and was located 25-1/2 feet from


| | |
|---|-----------------------------|
|  <p>National Transportation Safety Board FACTUAL REPORT AVIATION</p> | NTSB ID: CHI04IA056 |
| | Occurrence Date: 01/17/2004 |
| | Occurrence Type: Incident |

Narrative (Continued)

the right edge of the runway. The last set of tire marks began 3,426 feet from the approach end of the runway. This area consisted of three parallel tire marks which were angled from the right edge toward the center of the runway. The mark corresponding with the right main gear was 57 feet long and it began 38 feet from the right side of the runway. The center mark was 20 feet long and it began 47 feet from the right side of the runway. The mark corresponding to the left main gear was 71 feet long and it began 50 feet from the right edge of the runway.

ADDITIONAL INFORMATION

The Transportation Safety Board of Canada assigned an accredited representative to the investigation. Personnel from Bombardier and Transport Canada were assigned as technical advisors to the accredited representative. Parties to the investigation were the FAA and SkyWest Airlines.

| | | | | | |
|--|-------------------------|---|--------------------------------|----------------------|--------------|
|  National Transportation Safety Board FACTUAL REPORT AVIATION | | NTSB ID: CHI04IA056 | | | |
| | | Occurrence Date: 01/17/2004 | | | |
| | | Occurrence Type: Incident | | | |
| Landing Facility/Approach Information | | | | | |
| Airport Name | Airport ID: | Airport Elevation | Runway Used | Runway Length | Runway Width |
| Rapid City Regional Airport | RAP | 3202 Ft. MSL | 32 | 8701 | 150 |
| Runway Surface Type: Concrete | | | | | |
| Runway Surface Condition: Dry | | | | | |
| Approach/Arrival Flown: ILS | | | | | |
| VFR Approach/Landing: None | | | | | |
| Aircraft Information | | | | | |
| Aircraft Manufacturer | | Model/Series | | Serial Number | |
| Bombardier | | CL-600-2B19 | | 7292 | |
| Airworthiness Certificate(s): Transport | | | | | |
| Landing Gear Type: Retractable - Tricycle | | | | | |
| Amateur Built Acft? No | Number of Seats: 54 | Certified Max Gross Wt. | 53000 LBS | Number of Engines: 2 | |
| Engine Type: | Engine Manufacturer: | Model/Series: | Rated Power: | | |
| Turbo Fan | General Electric | CF34-3B1 | 8900 LBS | | |
| - Aircraft Inspection Information | | | | | |
| Type of Last Inspection | Date of Last Inspection | Time Since Last Inspection | Airframe Total Time | | |
| Continuous Airworthiness | 01/2004 | 7 Hours | 11883 Hours | | |
| - Emergency Locator Transmitter (ELT) Information | | | | | |
| ELT Installed?/Type Yes / | ELT Operated? No | ELT Aided in Locating Accident Site? No | | | |
| Owner/Operator Information | | | | | |
| Registered Aircraft Owner | | Street Address | | | |
| Wachovia Bank NA Trustee | | 230 S Tryon St. | | | |
| | | City | State | Zip Code | |
| | | Charlotte | NC | 28202 | |
| Operator of Aircraft | | Street Address | | | |
| SKYWEST AIRLINES INC | | 444 South River Road | | | |
| | | City | State | Zip Code | |
| | | St. George | UT | 84790 | |
| Operator Does Business As: Skywest Airlines | | | Operator Designator Code: SWIA | | |
| - Type of U.S. Certificate(s) Held: | | | | | |
| Air Carrier Operating Certificate(s): Flag Carrier/Domestic | | | | | |
| Operating Certificate: | | | Operator Certificate: | | |
| Regulation Flight Conducted Under: Part 121: Air Carrier | | | | | |
| Type of Flight Operation Conducted: Scheduled; Domestic; Passenger Only | | | | | |
| FACTUAL REPORT - AVIATION | | | | | |

| | |
|--|-----------------------------|
|  <p>National Transportation Safety Board FACTUAL REPORT AVIATION</p> | NTSB ID: CHI04IA056 |
| | Occurrence Date: 01/17/2004 |
| | Occurrence Type: Incident |

First Pilot Information

| | | | | |
|-----------------|-----------------|------------------|--------------------------|-----------|
| Name On File | City On File | State On File | Date of Birth On File | Age 44 |
|-----------------|-----------------|------------------|--------------------------|-----------|

| | | | |
|--------|---------------------|------------------------------------|-----------------------------|
| Sex: M | Seat Occupied: Left | Occupational Pilot? Civilian Pilot | Certificate Number: On File |
|--------|---------------------|------------------------------------|-----------------------------|

Certificate(s): Airline Transport; Flight Instructor

Airplane Rating(s): Multi-engine Land; Single-engine Land

Rotorcraft/Glider/LTA: None

Instrument Rating(s): Airplane

Instructor Rating(s): Airplane Multi-engine; Airplane Single-engine; Instrument Airplane

Current Biennial Flight Review? 09/2003

| | | |
|------------------------|--|------------------------------------|
| Medical Cert.: Class 1 | Medical Cert. Status: Valid Medical--no waivers/lim. | Date of Last Medical Exam: 09/2003 |
|------------------------|--|------------------------------------|

| - Flight Time Matrix | All A/C | This Make and Model | Airplane Single Engine | Airplane Multi-Engine | Night | Instrument | | Rotorcraft | Glider | Lighter Than Air |
|-----------------------|---------|---------------------|------------------------|-----------------------|-------|------------|-----------|------------|--------|------------------|
| | | | | | | Actual | Simulated | | | |
| Total Time | 12000 | 1196 | 1800 | 10000 | 2500 | 1400 | 800 | 0 | 0 | 0 |
| Pilot In Command(PIC) | 7500 | 1196 | 1700 | 6000 | 2000 | 1100 | 800 | 0 | 0 | 0 |
| Instructor | 1600 | | 400 | 1200 | 250 | 80 | 400 | 0 | 0 | 0 |
| Instruction Received | | | | | | | | | | |
| Last 90 Days | 195 | 195 | | 195 | | | | | | |
| Last 30 Days | 65 | 65 | | 65 | | | | | | |
| Last 24 Hours | 5 | 5 | | 5 | | | | | | |

| | | | |
|--------------------|----------------------------|--------------------------|-------------------|
| Seatbelt Used? Yes | Shoulder Harness Used? Yes | Toxicology Performed? No | Second Pilot? Yes |
|--------------------|----------------------------|--------------------------|-------------------|

Flight Plan/Itinerary

Type of Flight Plan Filed: IFR

| | | | | |
|-----------------------------------|-------------|---------------------------|------------------------|------------------|
| Departure Point SALT LAKE CITY | State UT | Airport Identifier SLC | Departure Time 2035 | Time Zone MST |
|-----------------------------------|-------------|---------------------------|------------------------|------------------|

| | | | |
|---|-------|---------------------------|--|
| Destination Same as Accident/Incident Location | State | Airport Identifier RAP | |
|---|-------|---------------------------|--|


Type of Clearance: IFR

Type of Airspace: Class D

Weather Information

Source of Wx Information:

Company

| | |
|--|-----------------------------|
|  <p>National Transportation Safety Board FACTUAL REPORT AVIATION</p> | NTSB ID: CHI04IA056 |
| | Occurrence Date: 01/17/2004 |
| | Occurrence Type: Incident |

Weather Information

| WOF ID | Observation Time | Time Zone | WOF Elevation | WOF Distance From Accident Site | Direction From Accident Site |
|--------|------------------|-----------|---------------|---------------------------------|------------------------------|
| RAP | 2211 | MST | 3204 Ft. MSL | 0 NM | 0 Deg. Mag. |

| | | |
|-----------------------------|---------|---------------------------|
| Sky/Lowest Cloud Condition: | Ft. AGL | Condition of Light: Night |
|-----------------------------|---------|---------------------------|

| | | | | | |
|----------------------------------|-------------|------------------|----|------------------|-----|
| Lowest Ceiling: Indefinite (V V) | 100 Ft. AGL | Visibility: 0.25 | SM | Altimeter: 30.13 | "Hg |
|----------------------------------|-------------|------------------|----|------------------|-----|

| | | |
|--------------------|------------------|--|
| Temperature: -2 °C | Dew Point: -2 °C | Weather Conditions at Accident Site: Instrument Conditions |
|--------------------|------------------|--|

| | | |
|--------------------|---------------|-------------|
| Wind Direction: 70 | Wind Speed: 6 | Wind Gusts: |
|--------------------|---------------|-------------|


| | | | |
|-------------------|-----|------------------|----|
| Visibility (RVR): | Ft. | Visibility (RVV) | SM |
|-------------------|-----|------------------|----|

Precip and/or Obscuration:

Accident Information

| | | |
|------------------------|---------------------|--------------------------|
| Aircraft Damage: Minor | Aircraft Fire: None | Aircraft Explosion: None |
|------------------------|---------------------|--------------------------|

| - Injury Summary Matrix | Fatal | Serious | Minor | None | TOTAL |
|-------------------------|-------|---------|-------|------|-------|
| First Pilot | | | | 1 | 1 |
| Second Pilot | | | | 1 | 1 |
| Student Pilot | | | | | |
| Flight Instructor | | | | | |
| Check Pilot | | | | | |
| Flight Engineer | | | | | |
| Cabin Attendants | | | | 1 | 1 |
| Other Crew | | | | | |
| Passengers | | | | 32 | 32 |
| - TOTAL ABOARD - | | | | 35 | 35 |
| Other Ground | | | | | |
| - GRAND TOTAL - | | | | 35 | 35 |

| | |
|--|-----------------------------|
|  <p>National Transportation Safety Board FACTUAL REPORT AVIATION</p> | NTSB ID: CHI04IA056 |
| | Occurrence Date: 01/17/2004 |
| | Occurrence Type: Incident |

Administrative Information

Investigator-In-Charge (IIC)
Pamela S. Sullivan

Additional Persons Participating in This Accident/Incident Investigation:

Alan Christianson
FAA, Rapid City, SD FSDO
Rapid City, SD

Erin Gormley
NTSB
Washington, DC

Dan Bower
NTSB
Washington, DC

John O'Callaghan
NTSB
Washington, DC

Jim Donnelly
Bombardier Regional Aircraft
Downsview, Ontario,

Donald Eick
NTSB
Washington, DC

John Britten
TSB
Quebec, Canada,

Klen Brooks
Skywest Airlines
St. George, UT

National Transportation Safety Board
Washington, DC 20594

Printed on : 6/12/2011 7:59:51 AM

Brief of Incident

Adopted 02/02/2007

CH104IA056
File No. 21071 01/17/2004 Rapid City, SD Aircraft Reg No. N595SW Time (Local): 22:11 MST

Make/Model: Bombardier / CL-600-2B19
Engine Make/Model: General Electric / CF34-3B1
Aircraft Damage: Minor
Number of Engines: 2
Operating Certificate(s): Flag Carrier/Domestic
Name of Carrier: SKYWEST AIRLINES INC
Type of Flight Operation: Scheduled; Domestic; Passenger Only
Reg. Flight Conducted Under: Part 121: Air Carrier

| | Fatal | Serious | Minor/None |
|------|-------|---------|------------|
| Crew | 0 | 0 | 3 |
| Pass | 0 | 0 | 32 |

Last Depart. Point: SALT LAKE CITY, UT
Destination: Same as Accident/Incident Location
Airport Proximity: On Airport/Airstrip
Airport Name: Rapid City Regional Airport
Runway Identification: 32
Runway Length/Width (Ft): 8701 / 150
Runway Surface: Concrete
Runway Surface Condition: Dry

Condition of Light: Night
Weather Info Src: Weather Observation Facility
Basic Weather: Instrument Conditions
Lowest Ceiling: 100 Ft. AGL, Indefinite (V V)
Visibility: .25 SM
Wind Dir/Speed: 070 / 006 Kts
Temperature (°C): -2
Precip/Obscuration:

Pilot-in-Command Age: 44

Flight Time (Hours)

Certificate(s)/Rating(s)
Airline Transport; Flight Instructor; Multi-engine Land; Single-engine Land

Total All Aircraft: 12000
Last 90 Days: 195
Total Make/Model: 1196
Total Instrument Time: 2200

Instrument Ratings
Airplane

The airplane, being operated on a scheduled passenger flight, contacted the runway with the left wing tip, following a loss of control while landing. Weather conditions were varying due to freezing fog that was moving into and out of the area. The control tower at the destination airport was closed and the airplane was being controlled by a near-by approach control facility. After holding in-flight to wait for the weather to improve, the crew began the instrument landing system (ILS) approach when the visibility was reported as one-half mile. The captain stated that almost immediately upon entering the top of the fog layer they received an ICE caution message. He stated they turned on the wing and engine inlet anti-ice, but the ice accumulation on the windshield wipers was rapid and ice was accumulating on the winglet. The captain stated the approach lights came into sight when they were just above minimums and that he had the runway in sight at approximately 140 feet above the ground. The first officer then disconnected the autopilot and the nose came up slightly. He stated he informed the first officer to keep the nose down and add thrust. The captain stated they were slightly left of the centerline and the first officer was making "small" corrections back to the right. He stated the airspeed was just inside the "bottom of the bucket" and the trend vector was indicating a decrease in airspeed. The captain stated he "again said something about more thrust and keeping the nose down." He stated the airplane continued to move to the right of the centerline and he took control of the airplane. He stated the airplane responded "poorly" feeling "heavy and sluggish." The captain stated the airplane was close to the right side of the runway and he added thrust at which time the ailerons became more responsive. He stated the left wing dropped, scraping the runway, at about the same time the left main gear touched down. The captain stated the airplane bounced into the air then landed hard on the runway. The crew then taxied the airplane to the gate. The first officer stated that when the captain reported having the runway in sight, she transitioned her sight outside of the airplane and realized she needed to correct to the right. She

Brief of Incident (Continued)

CHI04IA056

File No. 21071

01/17/2004

Rapid City, SD

Aircraft Reg No. N595SW

Time (Local): 22:11 MST

stated she began the correction at which time the nose of the airplane pitched up, the airplane veered toward the correction, and it started sinking toward the right side of the runway. She stated the captain took over the controls, but the airplane dropped to the runway, bounced, and touched down harder the second time. The first officer, who was flying the approach, had about 15 hours of total flight time in the CL-600. The captain, who was also a check airman, had a total of 1,196 hours of flight time in the CL-600. At the time of the accident the local weather was reported as being visibility 1/4 mile in freezing fog, vertical visibility 100 feet. Inspection of the airport and airplane on the afternoon following the incident revealed ice was still visible on the antennas, windshield wipers, radome, winglets, and horizontal and vertical stabilizers. The main body of ice on these structures measured between one-half to five-eighths of an inch thick and that the main body of ice plus the "ice spines" totaled three-quarters of an inch thick. A Kinematic parameter extraction showed loss of lift consistent with airframe icing but there was no early stall due to icing prior to touchdown and no indication that airframe icing had caused any loss of control. Marks on the ground and on the runway revealed the airplane initially touched down 1,976 feet from the approach end of the runway with the right main landing gear in the grass off the side of the runway. The left wing tip then left a 63-foot long scrape mark on the runway, which was followed about 1,100 feet later by another set of tire marks. Data from the flight data recorder showed the airplane rolled slightly to the left followed by a roll to the right when the autopilot was disengaged. It then showed the airplane touched down with a vertical acceleration of at least 1.8g's. The airplane then became airborne in a 16-degree left bank, with a 5-degree nose up pitch at which time the ground and flight spoilers deployed contributing to the firmness of the 3.25 g touchdown one second later.

Brief of Incident (Continued)

CHI04IA056
File No. 21071 01/17/2004 Rapid City, SD Aircraft Reg No. N595SW Time (Local): 22:11 MST

Occurrence #1: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: LANDING - FLARE/TOUCHDOWN

Findings

1. (F) WEATHER CONDITION - LOW CEILING
2. (F) WEATHER CONDITION - FOG
3. WEATHER CONDITION - ICING CONDITIONS
4. (C) AIRCRAFT CONTROL - NOT MAINTAINED - COPILOT/SECOND PILOT
5. (C) REMEDIAL ACTION - DELAYED - PILOT IN COMMAND
6. AIRCRAFT CONTROL - ATTEMPTED - PILOT IN COMMAND

Occurrence #2: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: LANDING - FLARE/TOUCHDOWN

Findings

7. TERRAIN CONDITION - RUNWAY
8. TERRAIN CONDITION - GROUND
9. RECOVERY FROM BOUNCED LANDING - PERFORMED - PILOT IN COMMAND

Findings Legend: (C) = Cause, (F) = Factor

The National Transportation Safety Board determines the probable cause(s) of this incident as follows.
The copilot's failure to maintain control of the airplane during the landing and the captain's delay in initiating remedial action. Factors contributing to the accident were the low ceiling and low visibility due to fog, and the aircraft's deviation from expected performance due to airframe icing.