



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Washington, D.C. 20594

September 29, 2022

Specialist's Factual Report

METEOROLOGY

DCA22LA178

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A. ACCIDENT

Location: Atlanta, Georgia
Date: August 6, 2022
Time: about 2121 eastern daylight time (0121 UTC on August 7, 2022)¹
Aircraft: Type – Boeing 757-251; Registration – N540US

B. METEOROLOGIST

Mike Richards
Senior Meteorologist
Operational Factors Division (AS-30)
National Transportation Safety Board

C. DETAILS OF THE INVESTIGATION

The National Transportation Safety Board’s meteorological specialist did not travel in support of this accident investigation and gathered all weather data remotely. Unless otherwise noted, all times are in eastern daylight time for August 6, 2022 (based upon the 24-hour clock), directions are referenced to true north, distances are in nautical miles and heights are above mean sea level. The accident site was located at about: 33.63185406° north latitude; 84.43733454° west longitude at an elevation of about 1,010 feet.

This report provides information on the weather conditions and forecasts applicable to the accident time and location.

D. WEATHER INFORMATION

1.0 Surface Observations

An Automated Surface Observing System (ASOS) was located at Hartsfield - Jackson Atlanta International Airport (ATL²), in Atlanta, Georgia, which was the site of the accident at a nominal elevation of about 1,020 feet and with a magnetic variation of about 5° west.³ Augmented longline⁴ reports from the ATL ASOS during the times surrounding the accident time are presented here.

¹ UTC – abbreviation for Coordinated Universal Time

² This report uses the 3-digit International Air Transport Association format for airport identification, which does not use the geographic designating digit (e.g., “K” for stations in the continental U.S. and “P” for U.S. stations in Alaska and the Pacific region) as found in the 4-digit International Civil Aviation Organization (ICAO) identifier format. Weather observations from airports in this report are referenced by their reporting station’s identifier (using ICAO format that includes the geographic designating digit), not by the airport at which the reporting station is located.

³ The ASOS was located at coordinates: 42.77610, -84.59970.

⁴ “Longline” refers to the dissemination of weather observations with the intent that they are available in near-real

[1952] METAR KATL 062352Z 30007KT 10SM TS FEW040CB FEW110 SCT200 SCT250 30/22 A3018 RMK AO2 LTG DSNT NE SLP210 TSB38 OCNL LTGICCG VC N TS VC N MOV STNRY CB DSNT NE SE S NW T03000222 10328 20294 53005=

[2052] METAR KATL 070052Z 32003KT 10SM TS FEW045CB SCT065 SCT080 SCT170 BKN250 29/22 A3020 RMK AO2 SLP216 CONS LTGICCG N-NE AND E TS N-NE AND E MOV STNRY TCU DSNT SE-SW T02940217=

[2152] METAR KATL 070152Z 09020G26KT 7SM -TSRA FEW015 BKN044CB BKN080 OVC250 24/21 A3026 RMK AO2 PK WND 09026/0152 LTG DSNT ALQDS RAB52 SLP237 FRQ LTGICCG OHD AND ALQDS TS OHD AND ALQDS MOV STNRY CB DSNT ALQDS P0000 T02440211=

At 2052, the ATL ASOS reported a wind from 320° at 3 knots, visibility of 10 statute miles or greater, thunderstorms, few clouds at 4,500 feet above ground level (agl) with cumulonimbus clouds, scattered clouds at 6,500 feet agl, scattered clouds at 8,000 feet agl, scattered clouds at 17,000 feet agl, ceiling broken at 25,000 feet agl, temperature of 29° Celsius (C) and dew point temperature of 22°C, altimeter setting of 30.20 inches of mercury; Remarks: automated station with a precipitation discriminator, sea level pressure of 1021.6 hectopascals (hPa), continuous lightning in-cloud and cloud-to-ground to the north through northeast and east, stationary thunderstorm to the north through northeast and east, towering cumulus distant⁵ to the southeast through southwest, temperature of 29.4°C and a dew point temperature of 21.7°C.

At 2152, the ATL ASOS reported a wind from 090° at 20 knots with gusts to 26 knots, visibility of 7 statute miles, thunderstorm with light rain, few clouds at 1,500 feet agl, ceiling broken at 4,400 feet agl with cumulonimbus clouds, broken clouds at 8,000 feet agl, overcast clouds at 25,000 feet agl, temperature of 24°C and dew point temperature of 21°C, altimeter setting of 30.26 inches of mercury; Remarks: automated station with a precipitation discriminator, peak wind from 090° at 26 knots at 2152, lightning distant all quadrants, rain began at 2152, sea level pressure of 1023.7 hPa, frequent lightning in-cloud and cloud-to-ground overhead in all quadrants, stationary thunderstorm overhead in all quadrants, distant cumulonimbus clouds in all quadrants, trace liquid equivalent precipitation since 2052, temperature of 24.4°C and a dew point temperature of 21.1°C.

Five-minute data from the ATL ASOS for times surrounding the accident time are provided here.

[2105] 5-MIN KATL 070105Z VRB06KT 10SM TS FEW050 29/22 A3020 770 64 2600 VRB/06 RMK AO2 LTG DSNT N-SE T02940222

time to national databases (effectively, the whole world) and accessible to the general global public from a large number of vendors. This does not include public accessibility to observations from a reporting station's Very High Frequency (VHF; line-of-site) or telephone broadcast, where applicable. Longline-dissemination of weather observations is the primary vehicle through which the general global public has access to surface weather observations, particularly outside of the aviation community.

⁵ "Distant" indicates more than 10 miles from the aerodrome.

[2110] 5-MIN KATL 070110Z 07008KT 10SM TS CLR 29/21 A3021 760 58 2600 070/08
RMK AO2 LTG DSNT N-SE T02940206

[2115] 5-MIN KATL 070115Z 05007KT 10SM TS CLR 29/21 A3021 760 60 2600 060/07
RMK AO2 LTG DSNT N-SE T02940211

**[2120] 5-MIN KATL 070120Z 05010KT 10SM TS CLR 29/20 A3022 750 58 2600
050/10 RMK AO2 LTG DSNT N-SE T02890200**

**[2125] 5-MIN KATL 070125Z 05013G20KT 10SM TS SCT046 29/18 A3022 750 52
2500 050/13G20 RMK AO2 LTG DSNT N-SE PRESRR T02890183**

[2130] 5-MIN KATL 070130Z 04013KT 10SM TS BKN046 28/19 A3023 740 58 2400
050/13 RMK AO2 LTG DSNT N-SE PRESRR T02780189

At 2120, the ATL ASOS five-minute report indicated a wind from 050° at 10 knots, visibility of 10 statute miles or greater, thunderstorm, sky clear, temperature of 29°C and dew point temperature of 20°C, altimeter setting of 30.22 inches of mercury, pressure altitude of 750 feet, relative humidity of 58 percent, density altitude of 2,600 feet, magnetic wind direction of 050° with a wind magnitude of 10 knots; Remarks: automated station with a precipitation discriminator, distant lightning north through southeast, temperature of 28.9°C and dew point temperature of 18.3°C.

At 2125, the ATL ASOS five-minute report indicated a wind from 050° at 13 knots with gusts to 20 knots, visibility of 10 statute miles or greater, thunderstorm, scattered clouds at 4,600 feet agl, temperature of 29°C and dew point temperature of 18°C, altimeter setting of 30.22 inches of mercury, pressure altitude of 750 feet, relative humidity of 52 percent, density altitude of 2,500 feet, magnetic wind direction of 050° with a wind magnitude of 13 knots with gusts to 20 knots; Remarks: automated station with a precipitation discriminator, distant lightning north through southeast, pressure rising rapidly, temperature of 28.9°C and dew point temperature of 18.3°C.

One minute wind data⁶ from the ATL ASOS acquired from the National Weather Service (NWS) for times surrounding the accident time are provided here.⁷

<u>Time</u>	<u>W_Dir</u>	<u>W_Mag</u>	<u>G_Dir</u>	<u>G_Mag</u>
2115	052°	7	053°	9
2116	048°	8	041°	10
2117	043°	10	052°	15
2118	049°	12	054°	14
2119	054°	10	036°	12
2120	050°	10	051°	15
2121	052°	12	054°	14
2122	056°	12	056°	13

⁶ These wind data are not necessarily what would have been broadcast by the ASOS via very high frequency.

⁷ W_Dir = Direction of two-minute averaged wind (true); W_Mag = Magnitude of two-minute averaged wind (knots); G_Dir = Direction of maximum three-second wind during minute (true); G_Mag = Magnitude of maximum three-second wind during minute (knots); M = missing data

2323	056°	11	054°	13
2124	053°	11	053°	14
2125	048°	13	034°	20
2126	043°	15	045°	20
2127	040°	15	031°	17
2128	046°	14	058°	17
2129	047°	12	052°	16
2130	043°	13	036°	18

The following data were provided by the Federal Aviation Administration (FAA) and provide the windshear algorithm output data produced by the ATL Low-Level Windshear Alert System-Network Expansion (LLWAS-NE) that were available to the ribbon displays in the ATL air traffic control tower in 10-second increments immediately surrounding the accident time (time is in UTC). During this period, the LLWAS-NE wind information for the runway 09 approach was wind from 050° at 9 knots. No windshear or microburst alerts were active.

08-07-2022 01:20:27
AW 060 12

08LA 060 12
26RD 060 12
08RA 050 14
26LD 050 14
26RA 040 17
08LD 040 17
26LA 050 13
08RD 050 13
09LA 050 14
27RD 050 14
09RA 050 09
27LD 050 09
27RA 050 13
09LD 050 13
27LA 040 10
09RD 040 10
10-A 050 09
28-D 050 09
28-A 040 10
10-D 040 10

08-07-2022 01:20:37
AW 060 11

08LA 060 12
26RD 060 12
08RA 050 13
26LD 050 13

26RA 040 17
08LD 040 17
26LA 050 12
08RD 050 12
09LA 050 13
27RD 050 13
09RA 050 09
27LD 050 09
27RA 050 12
09LD 050 12
27LA 040 10
09RD 040 10
10-A 050 09
28-D 050 09
28-A 040 10
10-D 040 10

08-07-2022 01:20:47
AW 060 11

08LA 050 13
26RD 050 13
08RA 040 13
26LD 040 13
26RA 040 17
08LD 040 17
26LA 040 13
08RD 040 13
09LA 040 13
27RD 040 13
09RA 050 09
27LD 050 09
27RA 040 13
09LD 040 13
27LA 040 09
09RD 040 09
10-A 050 09
28-D 050 09
28-A 040 09
10-D 040 09

08-07-2022 01:20:57
AW 060 11

08LA 040 13
26RD 040 13
08RA 050 12
26LD 050 12
26RA 040 16
08LD 040 16

26LA 040 14
08RD 040 14
09LA 050 12
27RD 050 12
09RA 050 09
27LD 050 09
27RA 040 14
09LD 040 14
27LA 040 09
09RD 040 09
10-A 050 09
28-D 050 09
28-A 040 09
10-D 040 09

08-07-2022 01:21:07
AW 060 11

08LA 030 13
26RD 030 13
08RA 040 12
26LD 040 12
26RA 040 16
08LD 040 16
26LA 050 16
08RD 050 16
09LA 040 12
27RD 040 12
09RA 050 09
27LD 050 09
27RA 050 16
09LD 050 16
27LA 040 08
09RD 040 08
10-A 050 09
28-D 050 09
28-A 040 08
10-D 040 08

08-07-2022 01:21:17
AW 060 11

08LA 040 13
26RD 040 13
08RA 040 12
26LD 040 12
26RA 040 16
08LD 040 16
26LA 050 17
08RD 050 17

09LA	040	12
27RD	040	12
09RA	050	09
27LD	050	09
27RA	050	17
09LD	050	17
27LA	040	07
09RD	040	07
10-A	050	09
28-D	050	09
28-A	040	07
10-D	040	07

2.0 Weather Radar

Terminal Doppler Weather Radar (TDWR) Level-II data from the accident time from site TATL are presented in Figures 1-3. TATL was located about 9 miles east of the accident site at an elevation of about 1,075 feet. Assuming standard refraction and considering the 0.55° beam width for the TDWR radar beam, the TATL 0.264° and 0.967° tilt would have “seen” altitudes at the accident location of between about 1,200 and 1,700 feet and 1,800 and 2,400 feet, respectively. The reflectivity image (Figure 1) featured “bowing” segments of light reflectivity in the accident region and the accident time. Light to heavy areas of reflectivity were noted near to and distant from the accident location. The velocity imagery (Figures 2-3) depicted the accident location near a boundary of higher radial velocities (outbound from the TDWR). Loops of the reflectivity and velocity data indicate that the bowing segments of light reflectivity and boundaries of higher radial velocities were generally coincident and moving to the southwest and across the accident site near the accident time.

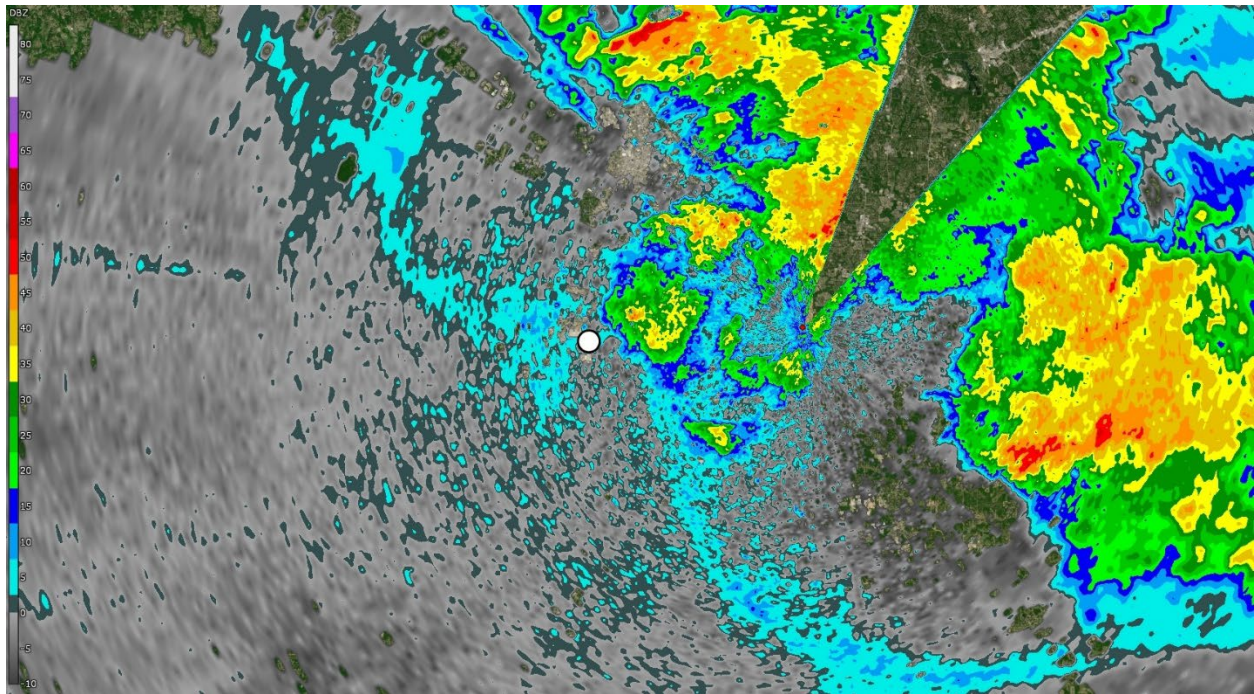


Figure 1 – TATL Level-II 0.264° reflectivity image from a sweep initiated at 2120:46. Accident site is denoted by the white dot.

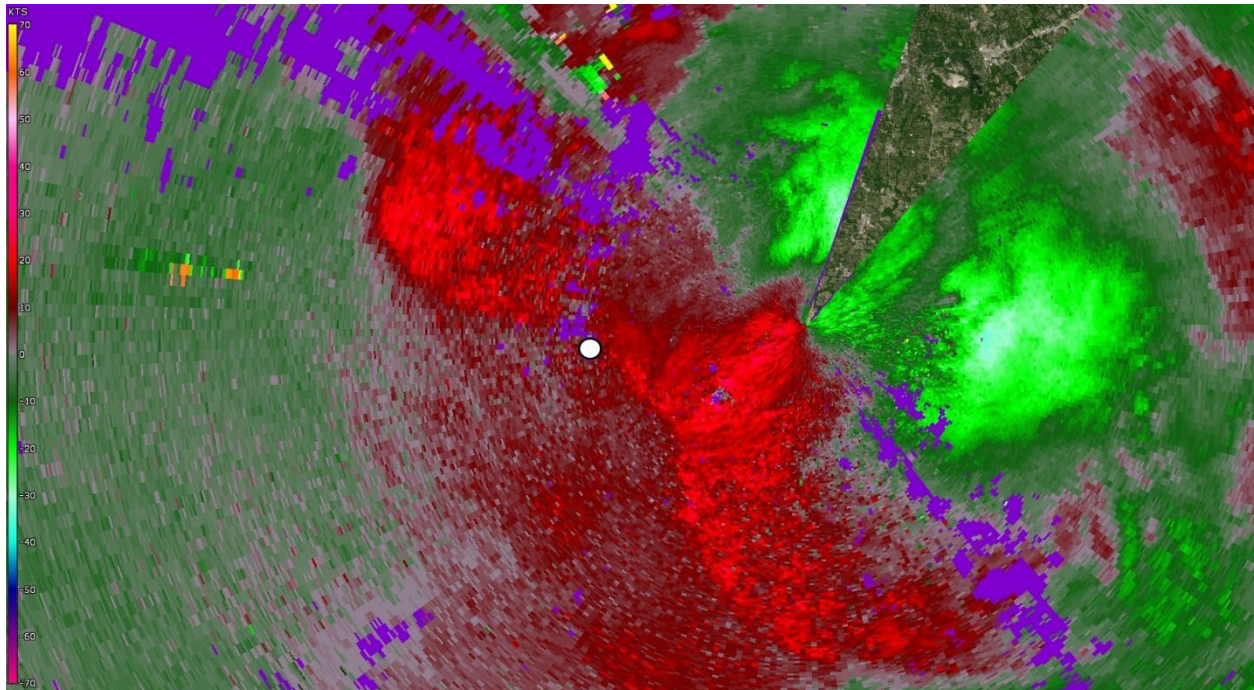


Figure 2 – TATL Level-II 0.264° velocity image from a sweep initiated at 2120:46. Accident site is denoted by the white dot.

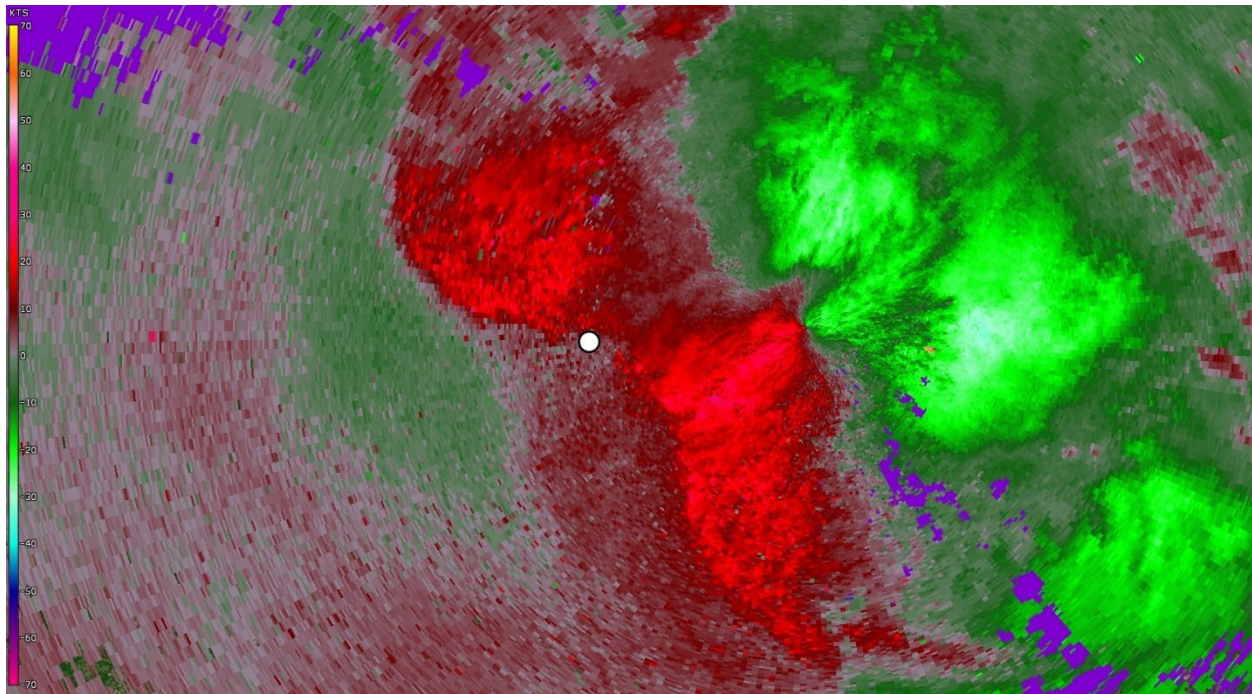


Figure 3 – TATL Level-II 0.967° velocity image from a sweep initiated at 2120:46. Accident site is denoted by the white dot.

3.0 Pilot Reports

There were no publicly longline-disseminated pilot reports⁸ (PIREPs) within 25 miles of the accident location 1900 and 2300.

4.0 Terminal Aerodrome Forecasts

The NWS produced Terminal Aerodrome Forecasts (TAF) for ATL. At 2104 a TAF was issued by the NWS for ATL that forecasted for the accident time: a wind from 260° at 7 knots, visibility greater than 6 statute miles, moderate rain showers, few clouds at 4,500 feet agl, few clouds at 12,000 feet agl, scattered clouds at 25,000 feet agl; temporary conditions⁹ between 2000 and 2200 of variable wind of 15 knots with gusts to 25 knots, visibility of 4 statute miles, thunderstorm with moderate rain, ceiling broken at 3,500 feet agl with clouds of cumulonimbus type.

**KATL 070004Z 0700/0806 26007KT P6SM SHRA FEW045 FEW120 SCT250
 TEMPO 0700/0702 VRB15G25KT 4SM TSRA BKN035CB
 FM070200 13004KT P6SM FEW050 SCT250**

⁸ These do not include pilot reports only broadcast via radio.

⁹ Temporary conditions - fluctuations to forecast conditions which are expected to last less than one hour in each instance and, in the aggregate, to cover less than half of the indicated period.

FM070900 10004KT P6SM FEW008 SCT012 SCT250
TEMPO 0709/0713 6SM BR SCT006 BKN012
FM071400 11006KT P6SM SCT025
FM071700 11007KT P6SM VCSH BKN040 PROB30 0719/0723 VRB15G25KT 4SM
TSRA BKN035CB=

5.0 Severe Thunderstorm Warning

There were no Severe Thunderstorm Warnings issued by the NWS that were active for the accident time in the accident region.

Submitted by:

Mike Richards
Senior Meteorologist