



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Washington, D.C. 20594

August 14, 2017

Weather Study

METEOROLOGY

DCA17FA145

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A. ACCIDENT

Location: Atlanta, Georgia
Date: June 23, 2017
Time: about 1338 EDT (1738 UTC)¹
Airplane: A321-200; N315DN

B. METEOROLOGIST

Mike Richards
Senior Meteorologist
Operational Factors Division (AS-30)
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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 (EDT) for June 23, 2017, directions are referenced to true north, distances are in nautical miles and heights are above mean sea level (msl).

D. Airport Wind Information

1.0 Official Airport Observations

An Automated Surface Observing System (ASOS) was located at ATL² (elevation 1,026 feet) in Atlanta, Georgia, which was the accident location. Figure 1 presents a map depicting the ASOS location. Reports from ATL during the times surrounding the accident time, which were augmented by a certified weather observer, are presented here:

[1152 EDT] METAR KATL 231552Z 21012G19KT 10SM SCT022 SCT100 BKN150
BKN250 27/21 A3002 RMK AO2 SLP156 T02720211=

¹ UTC – abbreviation for Coordinated Universal Time

² The National Weather Service (NWS) uses the 4-digit International Civil Aviation Organization (ICAO) format for station identifiers (as seen in the body of some formatted weather observations). This report uses the 3-digit International Air Transport Association format for station identification, which does not use the geographic designating digit ("K" for stations in the continental U.S. and "P" for U.S. stations in Alaska and the Pacific region) as found in the ICAO format.

[1252 EDT] METAR KATL 231652Z 24011G21KT 10SM SCT035 SCT100 BKN150
BKN250 29/21 A3001 RMK AO2 SLP150 T02940211=

**[1352 EDT] METAR KATL 231752Z 19019G24KT 10SM FEW040 SCT090 BKN250
29/21 A2999 RMK AO2 SLP143 T02940206 10300 20233 58014=**

[1452 EDT] METAR KATL 231852Z 22016G23KT 10SM SCT040 SCT100 BKN250
31/21 A2996 RMK AO2 PK WND 22029/1757 SLP135 T03060211=

At 1352 EDT, ATL reported a wind from 190° at 19 knots with gusts to 24 knots, visibility of 10 statute miles or greater, few clouds at 4,000 feet above ground level (agl), scattered clouds at 9,000 feet agl, ceiling broken at 25,000 feet agl, temperature of 29° Celsius (C) and a dew point temperature of 21°C, altimeter setting of 29.99 inches of mercury; remarks included: station with a precipitation discriminator.

2.0 High-Resolution ASOS Observations

Five-minute data from the ATL ASOS for an hour surrounding the accident time are provided here:

[1255 EDT] 5-MIN KATL 231655Z 21012G21KT 10SM SCT035 SCT100 BKN150
BKN250 29/21 A3001 950 60 2900 210/12G21 RMK AO2 T02940211

[1300 EDT] 5-MIN KATL 231700Z 21017G20KT 10SM SCT035 SCT100 BKN150
BKN250 29/21 A3001 950 60 2900 210/17G20 RMK AO2 T02940211

[1305 EDT] 5-MIN KATL 231705Z 22012G23KT 10SM SCT035 SCT100 BKN150
BKN250 29/21 A3001 950 60 2800 220/12G23 RMK AO2 T02890206

[1310 EDT] 5-MIN KATL 231710Z 20016G23KT 10SM SCT035 SCT100 BKN150
BKN250 29/21 A3001 950 60 2900 200/16G23 RMK AO2 T02940211

[1315 EDT] 5-MIN KATL 231715Z 20015G22KT 10SM SCT035 SCT100 BKN150
BKN250 29/21 A3000 950 60 2800 210/15G22 RMK AO2 T02890206

[1320 EDT] 5-MIN KATL 231720Z 22012G22KT 10SM SCT035 SCT100 BKN150
BKN250 29/21 A3000 950 60 2900 230/12G22 RMK AO2 T02940211

[1325 EDT] 5-MIN KATL 231725Z 21012G20KT 10SM SCT035 SCT100 BKN150
BKN250 29/21 A3000 950 60 2900 220/12G20 RMK AO2 T02940211

[1330 EDT] 5-MIN KATL 231730Z 23015G20KT 10SM SCT035 SCT100 BKN150
BKN250 30/21 A3000 960 56 2900 240/15G20 RMK AO2 T03000206

**[1335 EDT] 5-MIN KATL 231735Z 19014G21KT 10SM SCT035 SCT100 BKN150
BKN250 29/21 A2999 960 60 2900 200/14G21 RMK AO2 T02940211**

**[1340 EDT] 5-MIN KATL 231740Z 20015G21KT 10SM SCT035 SCT100 BKN150
BKN250 29/21 A2999 960 58 2900 210/15G21 RMK AO2 T02940206**

[1345 EDT] 5-MIN KATL 231745Z 20015G21KT 10SM SCT035 SCT100 BKN150
BKN250 30/21 A2999 970 58 2900 200/15G21 RMK AO2 T03000211

[1350 EDT] 5-MIN KATL 231750Z 20015G22KT 10SM FEW040 SCT090 BKN250
 29/21 A2999 970 58 2900 210/15G22 RMK AO2 SLP143 T02940206 10300
 20233 53002

At 1335 EDT, the ATL five-minute ASOS report indicated a wind from 190° at 14 knots with gusts to 21 knots, visibility of 10 statute miles or greater, scattered clouds at 3,500 feet agl, scattered clouds at 10,000 feet agl, ceiling broken at 15,000 feet agl, broken clouds at 25,000 feet agl, temperature of 29°C and a dew point temperature of 21°C, altimeter setting of 29.99 inches of mercury, pressure altitude³ of 960 feet, relative humidity of 60 percent, density altitude⁴ of 2,900 feet, magnetic wind from 200° at 14 knots with gusts to 21 knots; remarks included: station with a precipitation discriminator.

At 1340 EDT, the ATL five-minute ASOS report indicated a wind from 200° at 15 knots with gusts to 21 knots, visibility of 10 statute miles or greater, scattered clouds at 3,500 feet agl, scattered clouds at 10,000 feet agl, ceiling broken at 15,000 feet agl, broken clouds at 25,000 feet agl, temperature of 29°C and a dew point temperature of 21°C, altimeter setting of 29.99 inches of mercury, pressure altitude of 960 feet, relative humidity of 58 percent, density altitude of 2,900 feet, magnetic wind from 210° at 15 knots with gusts to 21 knots; remarks included: station with a precipitation discriminator.

Wind information⁵ from the ATL ASOS one-minute observations for 15 minutes surrounding the accident time are presented here:

<u>Time</u>	<u>W_Dir</u>	<u>W_Mag</u>	<u>G_Dir</u>	<u>G_Mag</u>
1329	233°	15	245°	20
1330	233°	15	241°	20
1331	211°	14	197°	20
1332	194°	15	199°	21
1333	196°	14	194°	19
1334	196°	13	198°	18
1335	193°	14	185°	18
1336	197°	14	185°	20
1337	206°	15	204°	20
1338	217°	14	210°	17
1339	217°	14	208°	21
1340	202°	15	203°	20
1341	201°	14	205°	18
1342	208°	14	207°	17
1343	206°	15	199°	18

³ The height of the standard atmosphere at which the station pressure would be observed.

⁴ The pressure altitude corrected for temperature variations from the standard atmosphere.

⁵ W_Dir = Direction of two-minute averaged wind (true); W_Mag = Magnitude of two-minute averaged wind (knots); G_Dir = Direction of five-second averaged wind (true); G_Mag = Magnitude of five-second averaged wind (knots); Precip = one-minute precipitation accumulation (inches).

3.0 LLWAS Data

Wind data from the Low Level Windshear Alert System (LLWAS) at ATL between 1330 and 1345 EDT (inclusive) were obtained from the FAA and are included in Attachment 1. The LLWAS wind data is archived in 10-second increments. In the following example, the date/time (UTC) is in **red text**, the “CF” is the two-minute average wind direction (magnetic) and magnitude (knots) with any gusts (knots) calculated from the “Airport Wind”⁶ remote station readings are in **blue text**, and the 10-second wind direction (magnetic) and magnitude (knots) from each individual remote station (in this example for remote station 1, identified by “RS#01”) are in **green text**. Remote Sensor position information is also included in Attachment 1.

03-01-2016 17:54 :54 RT CF: 010 16 G00 NwAvg: 006 18 RS#01 : 010 18 Ddiff +004 Sdiff 00

In the minutes surrounding the accident time, the ATL LLWAS remote station #1 retrieved wind directions between 187° and 208° (magnetic), wind magnitudes between 13 and 20 (knots), two-minute average wind directions between 190° and 210° (magnetic) and two-minute average wind magnitudes between 15 and 18 knots. During this period, ATL LLWAS remote station #2 retrieved wind directions between 181° and 215° (magnetic) and wind magnitudes between 8 and 22 knots.

Figure 1 presents a map of the LLWAS Remote Station locations, along with the location of the ASOS.

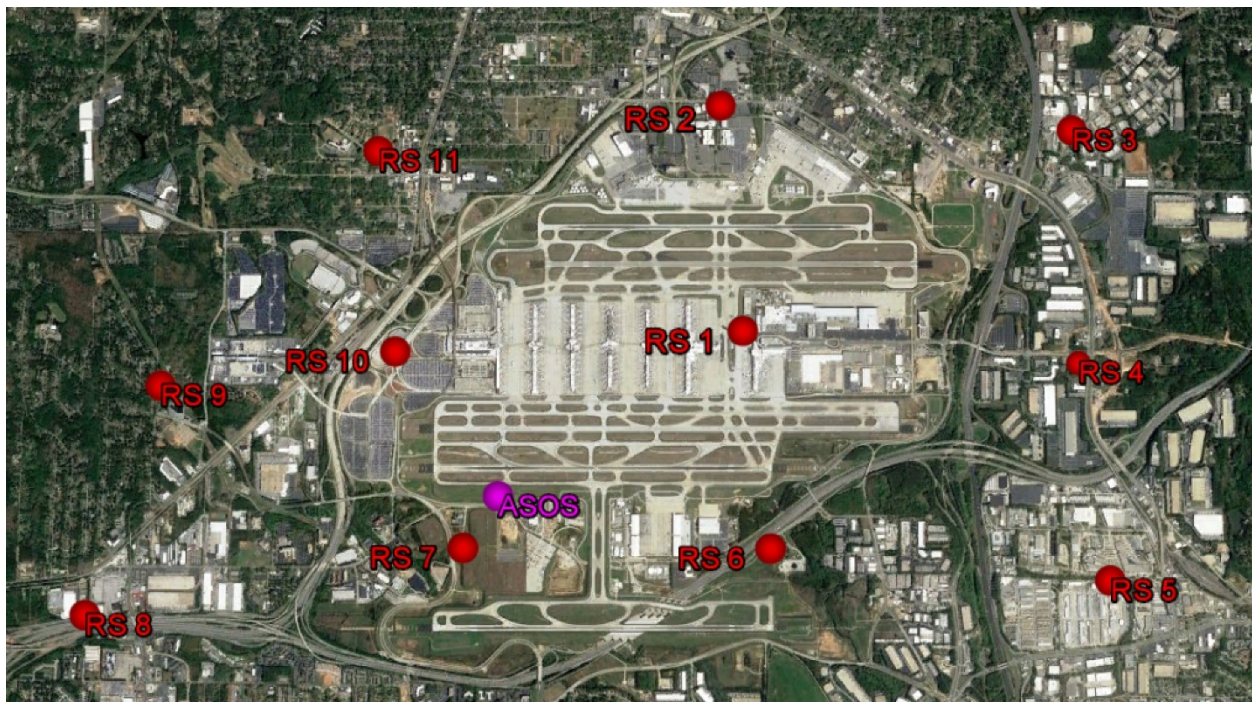


Figure 1 – ATL LLWAS Remote Station (RS) and ASOS locations.

⁶ The ATL LLWAS remote station acting as the “Airport Wind” was Remote Station #1.

E. LIST OF ATTACHMENTS

Attachment 1 - Wind data from the LLWAS at ATL between 1330 and 1345 EDT (inclusive)

Submitted by:

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