National Transportation Safety Board
Office of Aviation Safety
Washington, D.C. 20594-2000
January 5, 2011

METEOROLOGICAL FACTUAL REPORT

CEN10LA363

A. Incident

Location: FL360, West Carroll Parish, Louisiana
Date: June 28, 2010
Time: approximately 1752 central daylight time (2300 UTC[1])
Aircraft: Embraer EMB-145LR, registration: N601DW

B. Meteorological Specialist

Mike Richards
Meteorologist
National Transportation Safety Board
Operational Factors Division, AS-30
Washington, DC 20594-2000

C. Summary

On June 28, 2010, approximately 1752 central daylight time, N601DW, an Embraer EMB-145, d/b/a American Eagle flight 3224, encountered severe turbulence while in cruise flight at 36,000 feet approximately 10 miles east of Shreveport, Louisiana. The captain declared an emergency and landed without incident at East Texas Regional Airport (GGG), Longview, Texas, at 1824. The airline transport rated captain and the commercial rated first officer were not injured, and the one flight attendant was seriously injured. Of the 42 passengers on board; one was seriously injured and three sustained minor injuries. The airplane was not damaged. The airplane was registered to and operated by American Eagle Airlines, Incorporated, Fort Worth, Texas. An instrument flight rules (IFR) flight plan was filed for the flight that departed Piedmont Triad International Airport (GSO), Greensboro, North Carolina, at 1605 and was destined for Dallas/Fort Worth International Airport (DFW), Dallas-Fort Worth, Texas. Instrument meteorological conditions prevailed prior to the turbulence event for the scheduled passenger flight conducted under 14 Code of Federal Regulations Part 121.

[1] UTC – abbreviation for Coordinated Universal Time

D. Details of Investigation

The National Transportation Safety Board's (NTSB) meteorological specialist was not on scene and gathered weather data for this investigation from the NTSB's Washington D.C. office from official National Ocean and Atmospheric Administration (NOAA) National Weather Service (NWS) sources, except where noted. All times are reported in central daylight time (CDT) for June 28, 2010, based upon the 24 hour clock. Local time is -5 hours from UTC, and UTC=Z. Directions are referenced to true north unless otherwise noted and distances are in nautical miles. Heights are above mean sea level (msl) unless otherwise noted. Visibility is in statute miles (sm) and fractions of sm. Distances along surface of the earth are calculated using the "Great Circle" formula.

Coordinates used for the accident location at FL360[2]: 32.67694° North latitude, 91.51762° West longitude.

1.0 Synoptic Conditions

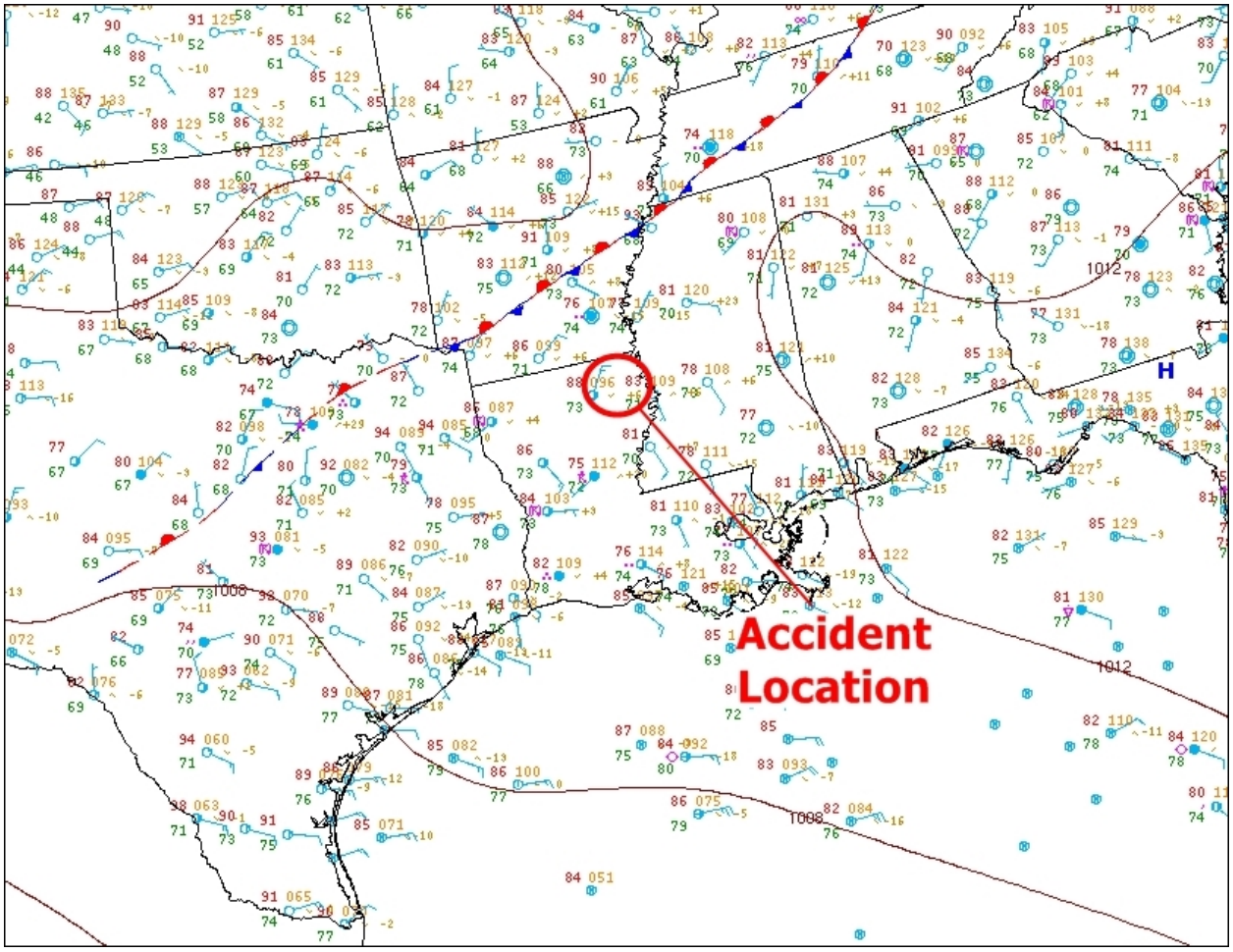

Figure 1 – NWS Surface Analysis Chart for 1900 CDT.

[2] Flight Level (FL) - standard nominal altitude of an aircraft, in hundreds of feet. This altitude is calculated from the International standard atmosphere using 1013.25 hPa (29.92 in Hg) for surface pressure.

The NWS Surface Analysis Chart for 1900 CDT on June 28, 2010 is included as figure 1. The chart depicted a stationary front extending from Kentucky southwestward through western Tennessee and central Arkansas and through the Dallas/Fort Worth area into central Texas. South of the front in the Louisiana/Mississippi region, surface models indicated winds were light (generally less than 10 knots) and variable, however a generally southerly to easterly flow was evident. Several stations in the vicinity of the accident site reported more northeasterly flow at the surface. Sky conditions were clear to partly cloudy in the region, and temperatures were in the mid-70°s to mid-80°s Fahrenheit (F). Dew point temperatures north of the Gulf Coast were in the low to mid-70°s F.

A Regional WSR-88D radar mosaic obtained from the National Mosaic and Multi-Sensor (NMQ) Project[3] at 1757:30 CDT (figure 2) indicated numerous areas of high reflectivity values (+50 dBZ) throughout the region.

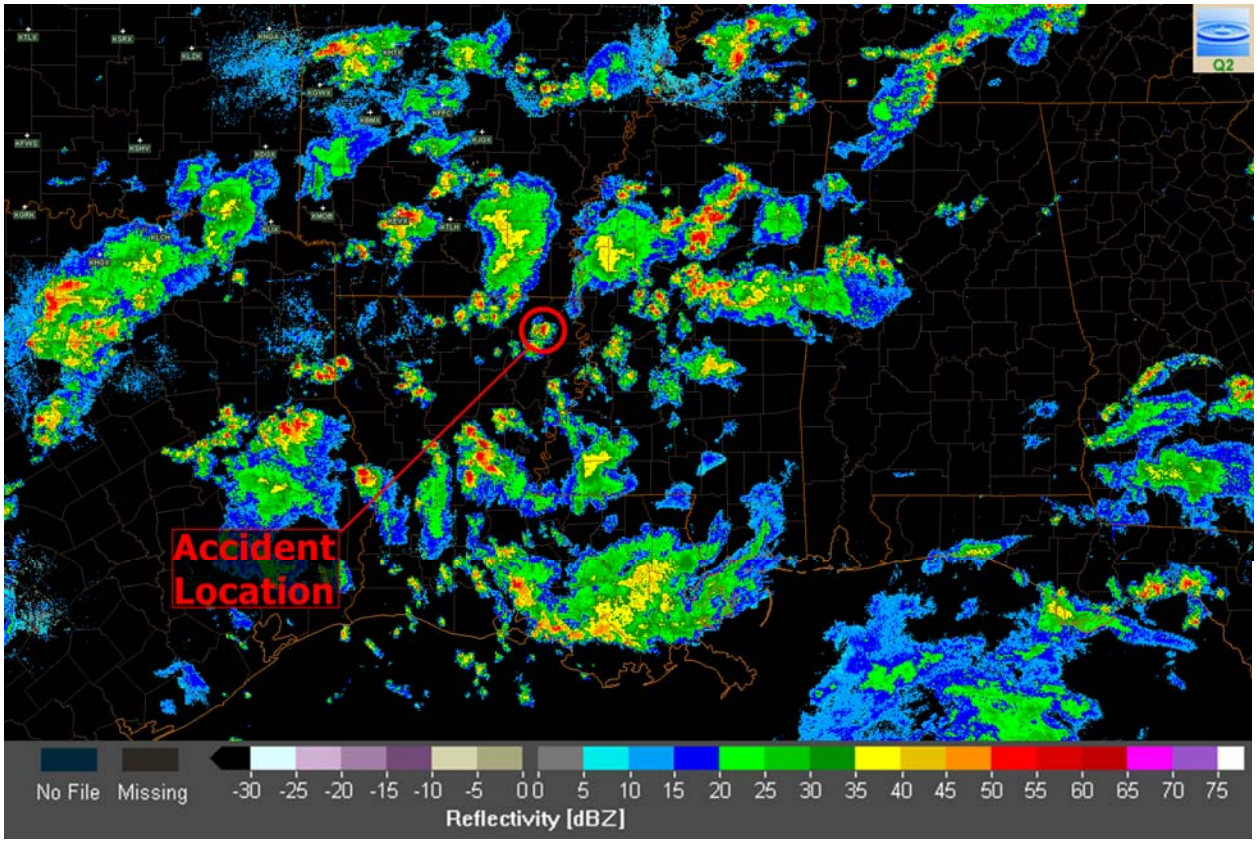

Figure 2 – WSR-88D radar mosaic valid at 1757:30 CDT.

[3]The NMQ project is a joint initiative between the National Severe Storms Laboratory, Federal Aviation Administration, National Weather Service/Office of Hydrologic Development, the Office of Climate, Water and Weather Services and the University of Oklahoma Cooperative Institute in Mesoscale Meteorological Studies.

2.0 Aviation Routine Weather Reports

Morehouse Memorial Airport (KBQP) in Bastrop, Louisiana, was located about 19 miles to the west of the accident site at an elevation of 168 feet, and was equipped with an Automated Weather Observing Systems (AWOS). These reports were automated and issued while an official weather observer was not logged into the AWOS system.

METAR KBQP 282148Z AUTO 17005KT 10SM CLR 39/21 A2981 RMK AO2 LTG DSNT NW THRU NE

METAR KBQP 282208Z AUTO 09007KT 10SM CLR 37/22 A2983 RMK AO2 LTG DSNT N AND NW

METAR KBQP 282229Z AUTO 10007KT 10SM VCTS CLR 37/23 A2981 RMK AO2 LTG DSNT N AND NW

METAR KBQP 282248Z AUTO 06006KT 10SM CLR 36/24 A2982 RMK AO2 LTG DSNT NW THRU E

METAR KBQP 282308Z AUTO 01005G17KT 10SM VCTS SCT065 BKN100 33/23 A2983 RMK AO2 LTG DSNT ALQS

METAR KBQP 282328Z AUTO 04005KT 10SM SCT065 SCT085 BKN100 31/23 A2982 RMK AO2 LTG DSNT ALQS

At 1729 CDT, KBQP reported wind from 100° at 7 knots, visibility of 10 miles or greater, thunderstorms in the vicinity, sky clear, temperature 37° Celsius (C), dew point temperature 23°C, altimeter setting 29.81 inches of mercury. Remarks: automated station with precipitation discriminator, distant lightning in the north and northwest octants.

At 1748 CDT, KBQP reported wind from 060° at 6 knots, visibility of 10 miles or greater, sky clear, temperature 36°C, dew point temperature 24°C, altimeter setting 29.82 inches of mercury. Remarks: automated station with precipitation discriminator, distant lightning in the northwest through east octants.

The AWOS at KBQP reported distant lightning ("LTG DSNT") consistently throughout the time period surrounding the accident. Distant lightning means lightning was detected between 10 and 30 miles from the station. At 1729 CDT, the AWOS at KBQP reported a thunderstorm in the vicinity ("VCTS"), which indicated lightning was detected between 5 and 10 miles from the station prior to the reporting time. The AWOS is limited to reporting only cloud-to-ground (CG) lightning strikes.

3.0 Upper Air Reports

3.0.1 Rawinsondes

Atmospheric data retrieved from a rawinsonde launch at 1900 CDT from Jackson, Mississippi (KJAN), located approximately 80 miles east-southeast of the accident site, is presented in figure 3.

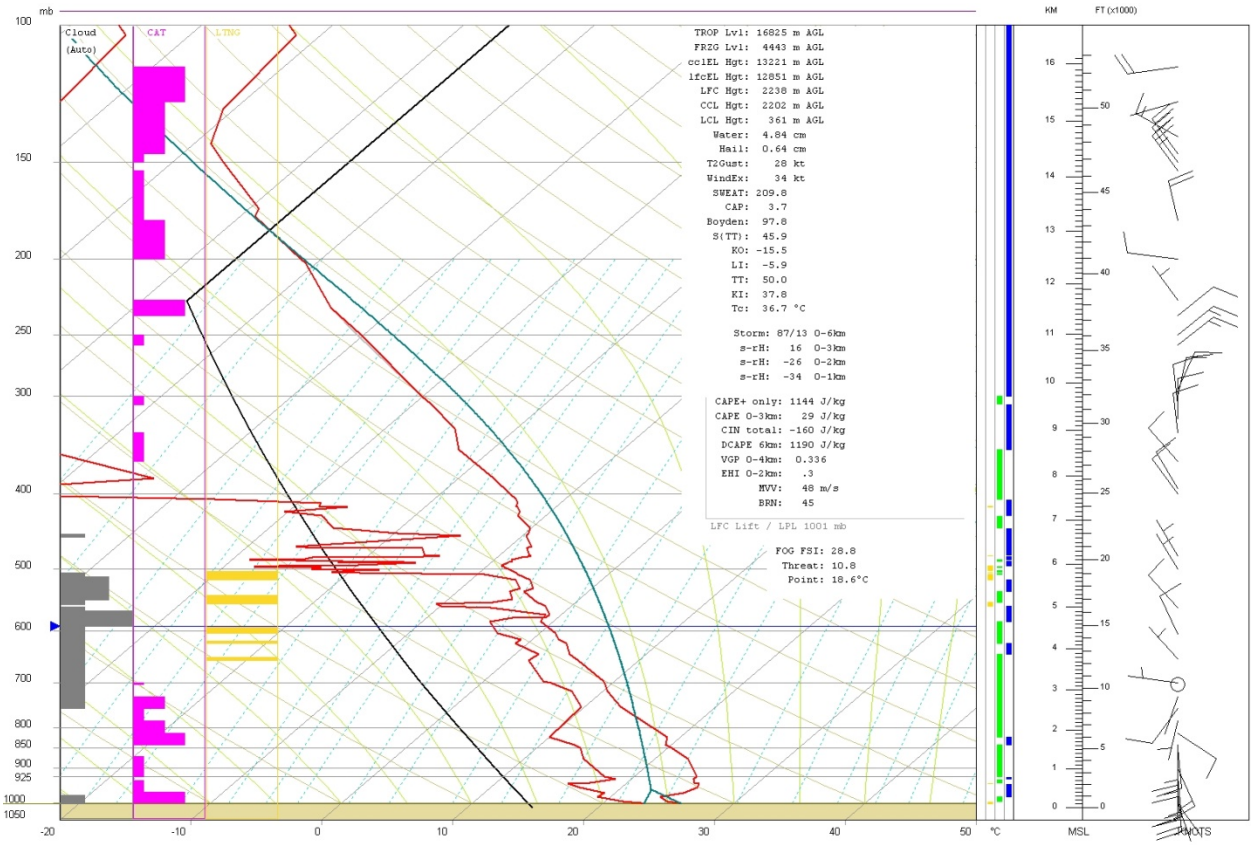

Figure 3 – Rawinsonde sounding from KJAN in SkewT/LogP[4] format (metric) for 1900 CDT, surface to 100mb.

The TJSJ 0800 EDT sounding indicated a mostly conditionally-unstable atmosphere from the surface to 25,000 feet (about 400 hectopascals [hPa]), above which the atmosphere was mostly stable through the lower stratosphere. The Lifting Condensation Level[5] (LCL) and Level of Free Convection[6] (LFC) were calculated as approximately 1,200 feet and 7,350 feet, respectively.

[4] SkewT/LogP - A thermodynamic diagram, using the temperature and the logarithm of pressure as coordinates, which allows the plotting of the vertical profile of the temperature, humidity, and atmosphere above a particular point on the earth's surface.

[5] Lifting Condensation Level - The level at which a parcel of moist air lifted dry-adiabatically would become saturated.

[6] Level of Free Convection - The level at which a parcel of air lifted dry-adiabatically until saturated and saturation-adiabatically thereafter would first become warmer than its surroundings in a conditionally unstable atmosphere. On a thermodynamic diagram the level of free convection is given by the point of intersection of the process curve, representing the process followed by the ascending parcel, and the sounding curve, representing the lapse rate of temperature in the environment.

Total surface-based Convective Available Potential Energy[7] (CAPE) was calculated as 1,144 J/kg. The 500-hPa Lifted Index[8] (LI) was -5.9°C. The K-Index[9] was 37.8, indicating about a 80% to 90% probability of thunderstorms. The tropopause was indicated to be near 55,000 feet, with the Equilibrium Level (EL)[10] at approximately 42,000 feet. Highest layer CAPE values occurred near 36,000 feet.

The wind profile indicated southerly winds at magnitudes of 5-20 knots from near the surface to 6,000 feet. Above 6,000 feet, the wind remained below 16 knots and *veered*[11] to the northeast through approximately 35,000. Above 35,000 feet winds were light and variable through 40,000 feet. The Universal Rawinsonde Observing program's (RAOB) calculations of clear air turbulence, which utilizes U.S. Air Force turbulence studies (e.g. AFGWC/TN 79/001), indicated severe clear air turbulence potential was present between about 37,000 and 38,000 feet. Lightning potential was positive between about 13,000 and 20,000 feet.

According to the ICAO International Standard Atmosphere (ISA), to which all standard aircraft instruments are calibrated, FL360 corresponds to pressure level 227 hPa. The KJAN sounding identified pressure level 227 hPa as being approximately 38,200 feet msl, which is a more accurate indication of the aircraft's true altitude.

3.0.2 Model Sounding

A North American Mesoscale (NAM) model sounding (figure 4) for the accident location at 1900 CDT was retrieved from the NOAA Air Resources Laboratory.

Total surface-based CAPE was calculated as 1,736 J/kg. The 500-hPa LI was -5.2°C. The K-Index was 40.4, indicating a near 100% probability of thunderstorms. The tropopause was indicated to be near 55,000 feet, with the EL at approximately 45,000 feet. Highest layer CAPE values occurred near 36,000 feet.

The wind profile indicated generally southerly winds at magnitudes of 5-11 knots from near the surface to about 8,500 feet. Above 8,500 feet, the wind remained below 11 knots and veered to the west through approximately 20,000. Between 20,000 and approximately 42,000 feet, the wind was from the west at magnitudes not exceeding 12 knots. RAOB did not find any altitudes with significant turbulence or lightning potential.

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[7] Convective Available Potential Energy - A measure of the amount of energy available for convection. CAPE is directly related to the maximum potential vertical speed within an updraft; thus, higher values indicate greater potential for severe weather.

[8] Lifted Index - A common measure of atmospheric instability. The value is obtained by computing the temperature that air near the ground would have if it were lifted to some higher level and comparing that temperature to the actual temperature at that level. Negative values indicate instability - the more negative, the more unstable the air.

[9] K-Index - A measure of the thunderstorm potential based on vertical temperature lapse rate, moisture content of the lower atmosphere, and the vertical extent of the moist layer. The K-index favors non-severe convection, especially heavy rain producing convection. Threshold values vary with season, location, and synoptic situation.

[10] Equilibrium Level - On a sounding, the level above the LFC at which the temperature of a rising air parcel again equals the temperature of the environment.

[11] A veering wind is a wind that turns clockwise with increasing height.

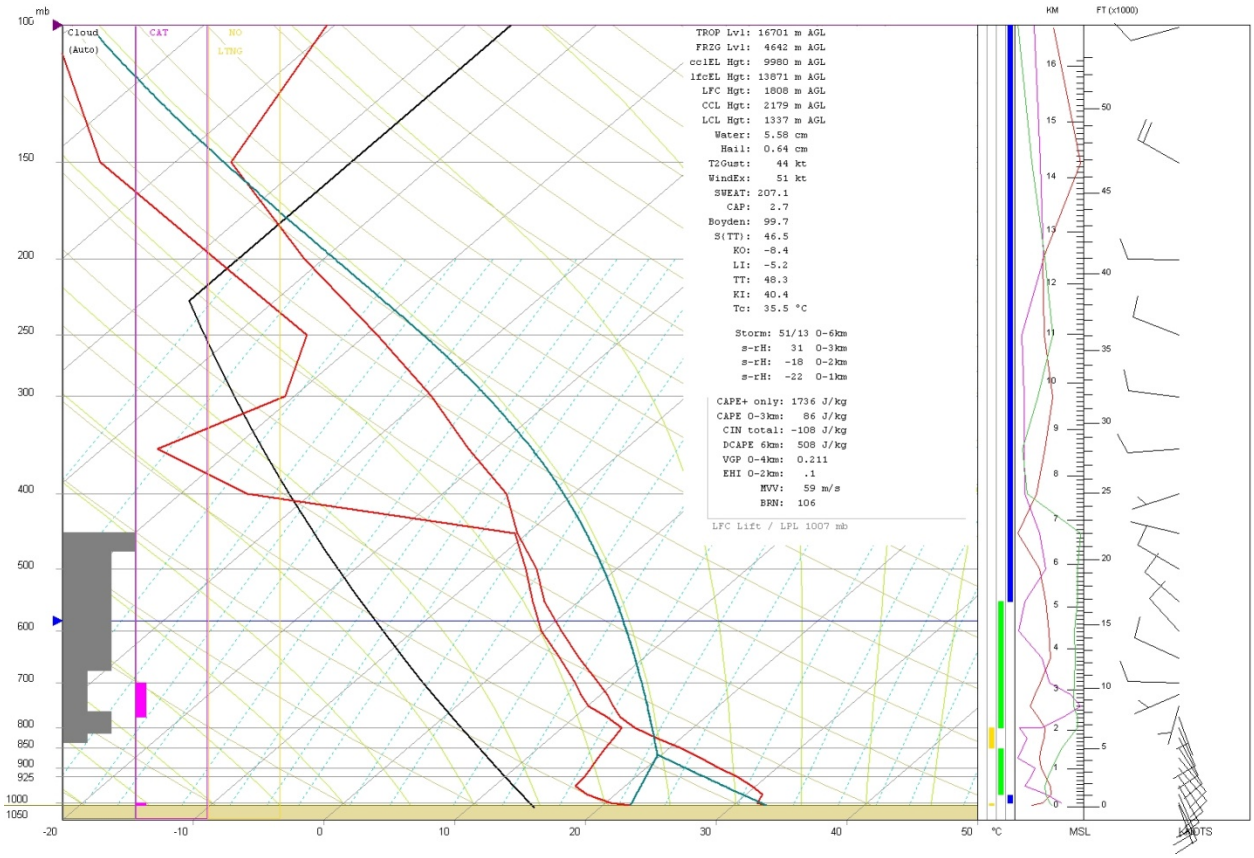

Figure 4 – NAM model sounding in SkewT/LogP format (metric) for 1900 CDT, surface to 100mb.

3.0.3 Pilot Reports

A pilot report made at 1755 CDT by an Embraer 145 is believed to be a report of the accident occurrence. The pilot reported severe turbulence, which included an 800 foot updraft (increase in aircraft altitude by 800 feet) and lasted for 30 seconds, at FL360 over Monroe, Louisiana.

> ELD UUA /OV MLU/TM 2255/FL360/TP E145/TB SEV/RM 800 FT UPDRAFT TURB LASTED 30 SECONDS AWC-WEB:KZFW=

No other pertinent pilot reports were found surrounding the time and location of the accident.

4.0 Weather Radar

WSR-88D Level-II base reflectivity "super resolution" imagery from Jackson, Mississippi (KDGX), located approximately 80 miles east-southeast of the accident site, is presented in figures 5 and 6. KDGX 0.48° elevation data (figure 5) from 1748:53 CDT (nominal time) identified a discrete "cell" of relatively strong reflectivity values (+50 dBZ) coincident with the accident aircraft's position at the time of the turbulence event. At a 0.48° tilt and 0.95° beamwidth[12], the WSR-88D "saw" altitudes between approximately 4,900 and 13,000 feet msl at the cell's location.

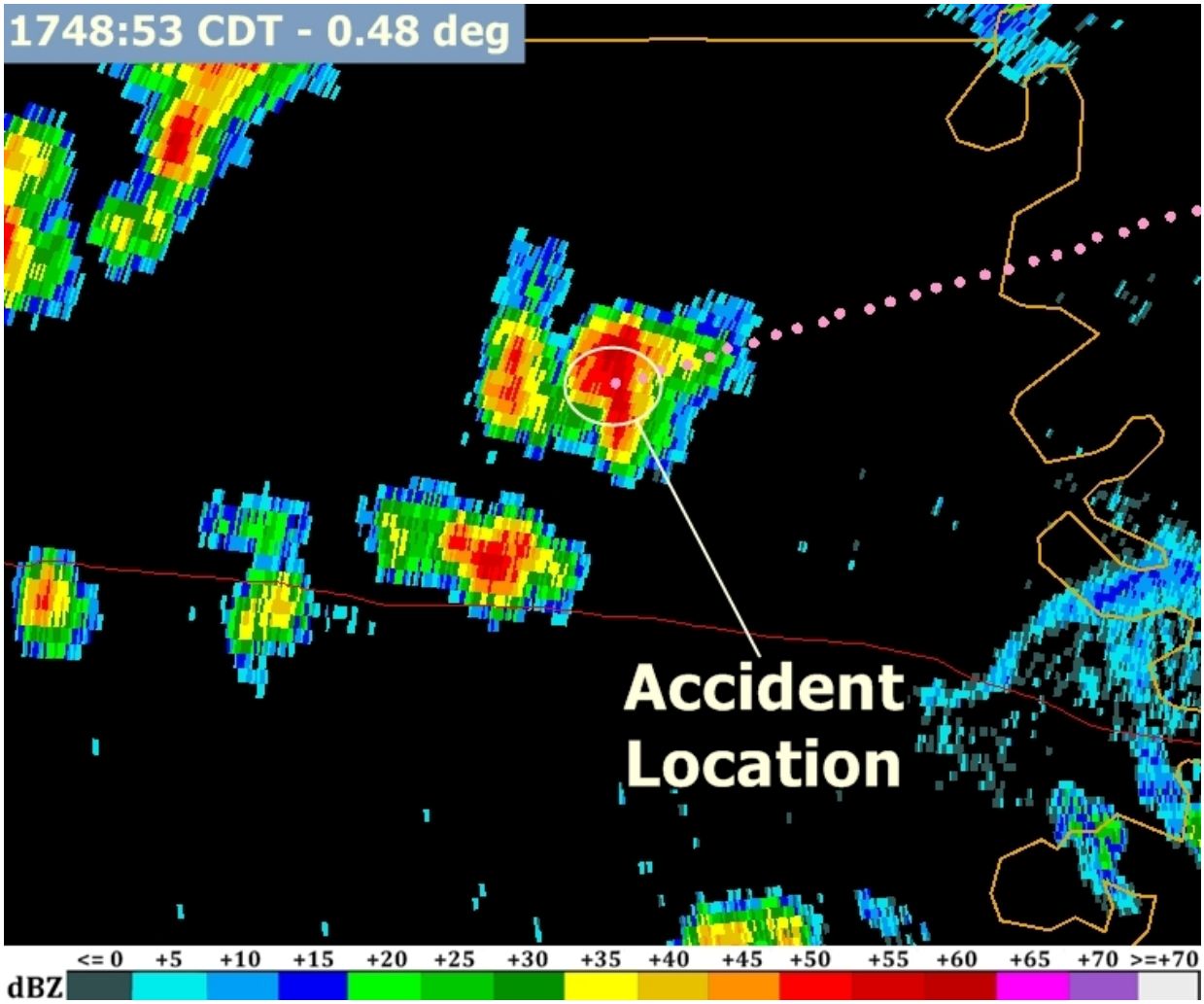

Figure 5 – Weather radar imagery from KDGX. Aircraft flight path shown as pink dots.

The 4.02° tilt scan (figure 6) from KDGX identified an increase in reflectivity values at the cell's location during the 13 minutes prior to the accident time. During this period, as the aircraft approached from the east, reflectivity values increased from "light" intensities (less than 25 dBZ) to more moderate intensities (45 dBZ) several minutes prior to the accident time. The 4.02° tilt saw between approximately 34,900 and 43,000 feet msl at the accident location, and is a more

[12] Beamwidth - the angular separation between the half power points on the antenna radiation pattern, where the gain is one half the maximum value.

appropriate tilt to examine the flight environment given the aircraft's altitude of approximately 38,200 feet.

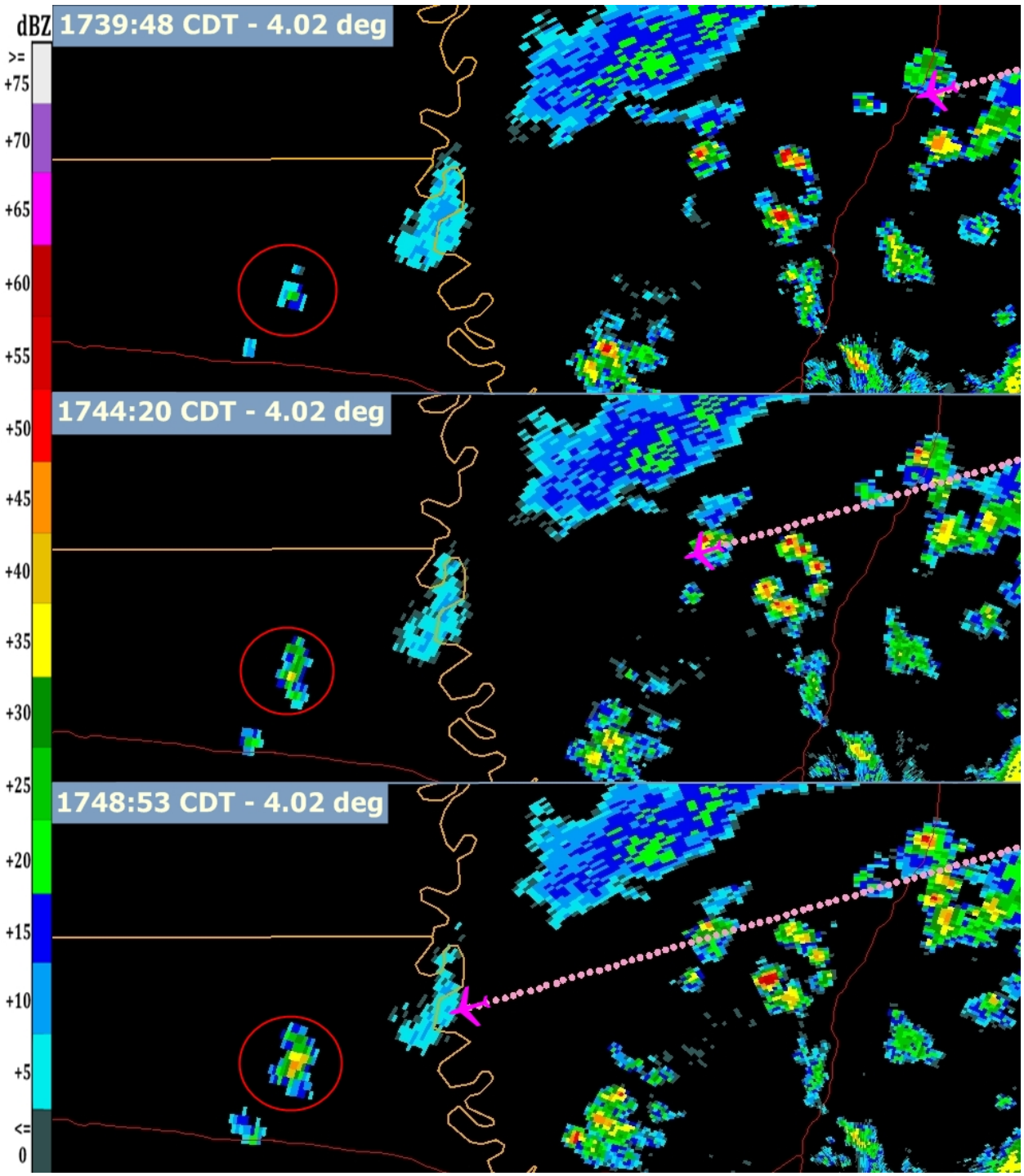

Figure 6 – Weather radar imagery from KDGX. Aircraft flight path shown as pink airplane/dots.

5.0 Lightning

Reports of lightning strokes for the coincident cell for the 15 minutes preceding the accident time were obtained from the WeatherBug Total Lightning Network (WTLN) and the National Lightning Detection Network (NLDN) operated by Vaisala. The stroke locations are presented in figure 7. The WTLN data contained both CG and intracloud (IC) stroke locations, while the NLDN data contains only CG information. These data indicated that a significant amount of lightning was present and detected in the coincident cell during the 15 minutes prior to accident.

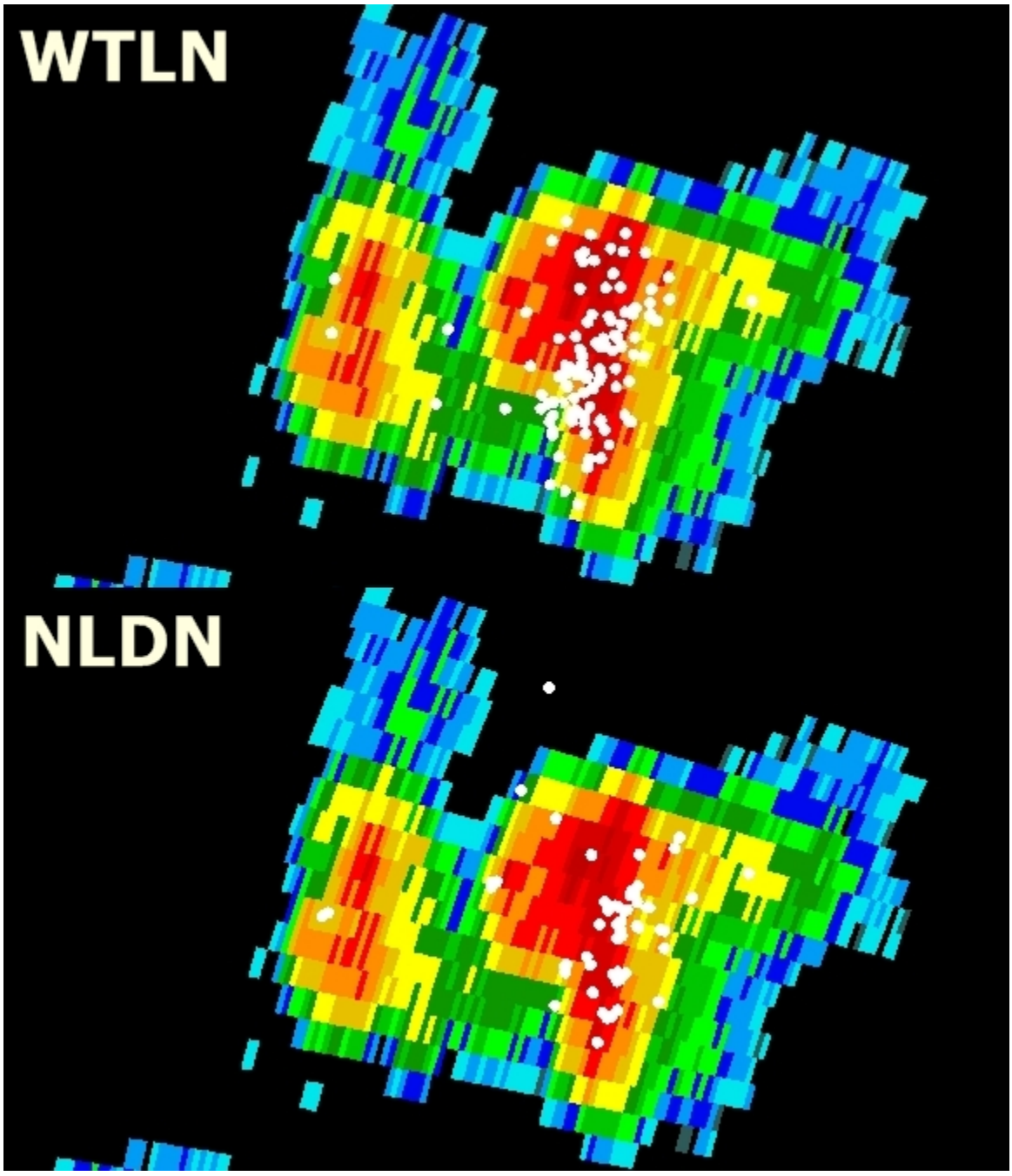

Figure 7 – Lightning strike data from the WTLN and NLDN overlaid onto weather radar imagery from KDGX at 1748:53 CDT.

6.0 Satellite Imagery

Geostationary Operational Environmental Satellite (GOES)-13 visible (0.65µm) and infrared (10.7µm) data was obtained from an archive at the Space Science Engineering Center at the University of Wisconsin-Madison and processed using the Man computer Interactive Data Access System (McIDAS). Visible imagery (at near 1km by 1km resolution) from 1733–1755 CDT in presented in figure 8. The GOES-13 visible imagery identified a rising column of air (updraft) in the 1740 scan that becomes collocated with the aircraft's position at the turbulence event (explained below) in the 1745 CDT scan. Infrared imagery (at near 4km by 4km resolution; figure 9) indicates cloud top temperatures for this cloud at 1745 CDT were -46.3°C, which corresponds to a height of about 38,500 feet (224 hPa) when considering the KJAN sounding.

Given the height of the cloud top and the viewing angle of the satellite, a parallax correction must be applied to provide the best possible spatial correlation between cloud location and aircraft position. Assuming a cloud height of 38,000 feet, the correction that must be applied to the highest cloud elements is 5.6 miles with a shift to the south-southeast (151°). For simplicity in presentation, we have shifted the aircraft position in figures 8 and 9 by 5.6 miles to the north-northwest (331°) to account for the spatial offset.

GOES-13 infrared imagery also indicated the accident aircraft's flight path (see figure 6 in section 4.0) from the east-northeast would have brought them through or below high cloud (blue and some of the green shading in figure 9) immediately prior to the turbulence encounter, where cloud top heights would have been above their flight altitude of approximately 38,200 feet.

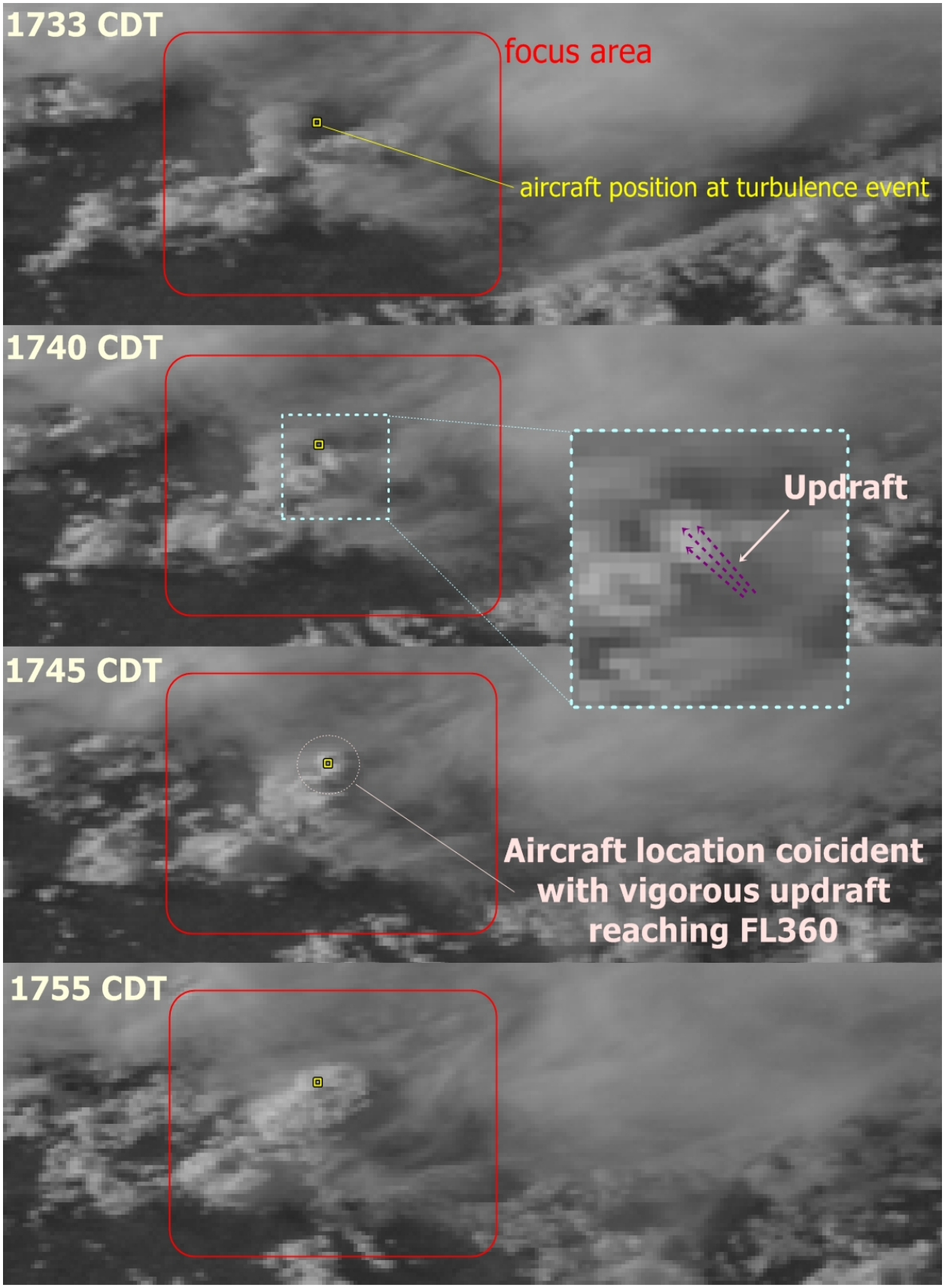

Figure 8 – GOES-13 visible (0.65μm) imagery from 1733-1755 CDT. Aircraft position at the time of the turbulence event, which has been shifted to account for parallax error of the cloud tops (see text), is denoted by the yellow square.

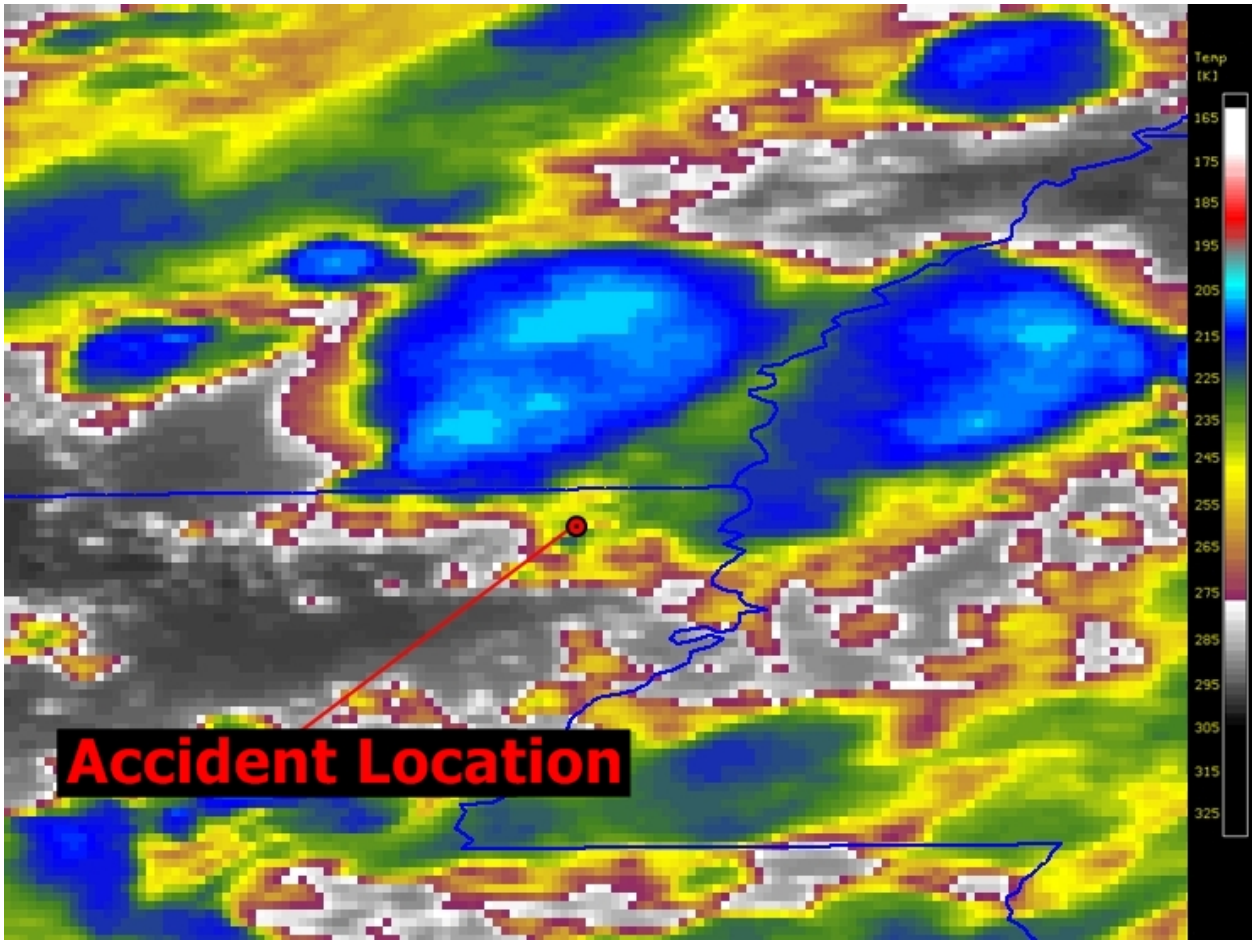

Figure 9 – GOES-13 infrared (10.7µm) imagery from 1745 CDT. Aircraft position at the time of the turbulence event has been shifted slightly to account for parallax error of the cloud tops.

7.0 Area Forecast

The NWS Chicago Area Forecast issued at 1345 CDT and valid until 0200 CDT on June 29, 2010, forecasted for regions of Arkansas, Louisiana and Mississippi. The forecast for southern Arkansas indicated broken clouds at 5,000 feet with tops to 10,000 feet, visibility 3 miles with scattered thunderstorms and light rain, cumulonimbus tops to FL450. The forecast for northern Louisiana indicated broken clouds at 5,000 feet with tops to 8,000 feet, scattered rain showers and thunderstorms and light rain, cumulonimbus tops to FL450 and broken cirrus clouds. The forecast for both northern and southern Mississippi indicated scattered thunderstorms (forecast for northern Mississippi was for widely scattered thunderstorms) and light rain with cumulonimbus tops to FL450.

FAUS44 KKCI 281845
FA4W
_DFWC FA 281845
SYNOPSIS AND VFR CLDS/WX
SYNOPSIS VALID UNTIL 291300
CLDS/WX VALID UNTIL 290700...OTLK VALID 290700-291300

OK TX AR TN LA MS AL
.
SEE AIRMET SIERRA FOR IFR CONDS AND MTN OBSCN.
TS IMPLY SEV OR GTR TURB SEV ICE LLWS AND IFR CONDS.
NON MSL HGTS DENOTED BY AGL OR CIG.
.
SYNOPSIS...CDFNT NERN KY SWWD TO NERN AR-XTRM NERN TX SWWD TO WRN TRANSPECOS. BY 00Z CDFNT ERN KY-WRN TN-SRN AR-NERN TX TO SWRN S CNTRL TX. BY 06Z STNR FNT ERN KY-NWRN TN-NRN AR-SRN OK BECMG CDFNT BY 13Z MOVG SWD TO SERN TN-NRN MN-SRN AR-XTRM SRN OK TO TX PNHDL.
.
AR
NRN...BKN060 TOP 100. OCNL BKN030. VIS 3SM SCT -SHRA/-TSRA. 00Z SCT CI. OTLK...VFR.
SRN...BKN050 TOP 100. VIS 3SM SCT -TSRA. CB TOP FL450. BECMG 0103 SCT050 BKN CI. OTLK...VFR.
.
LA
NRN...BKN050 TOP 080. SCT -SHRA/-TSRA. CB TOP FL450. 03Z BKN CI. OTLK...VFR.
SRN...BKN040 TOP 100. OCNL BKN020. VIS 3SM SCT TSRA. CB TOP FL450. BECMG 2301 SCT050 BKN CI. ISOL -TSRA. CB TOP FL400. OTLK...VFR.
.
MS/AL
NRN...BKN040 TOP 080. **WDLY SCT -TSRA. CB TOP FL450.** 02Z ISOL -SHRA. OTLK...VFR.
SRN-GULF COAST...BKN040 TOP 090. OCNL BKN025. VIS 3-5SM SCT TSRA. CB TOP FL450. BECMG 0003 SCT040 BKN CI. OTLK...MVFR BR.

8.0 In-Flight Weather Advisories

8.0.1 AIRMETs

AIRMETs issued and active for the accident time and location indicated no significant turbulence, icing or IFR[13] conditions expected outside of convective activity.

[13] IFR – Instrument Flight Rules: Ceilings less than 1,000 feet agl and/or visibility less than 3 miles.

8.0.2 SIGMETs

Between 2055 (approximately 2 hours before the accident) and 2255 (approximate accident time) there were nine Convective SIGMETs issued for the region (figure 10). Convective SIGMET 90C, issued at 1755 CDT (approximate accident time) and valid for two hours, was active for the accident site and advised of thunderstorms moving little, with tops above FL450.

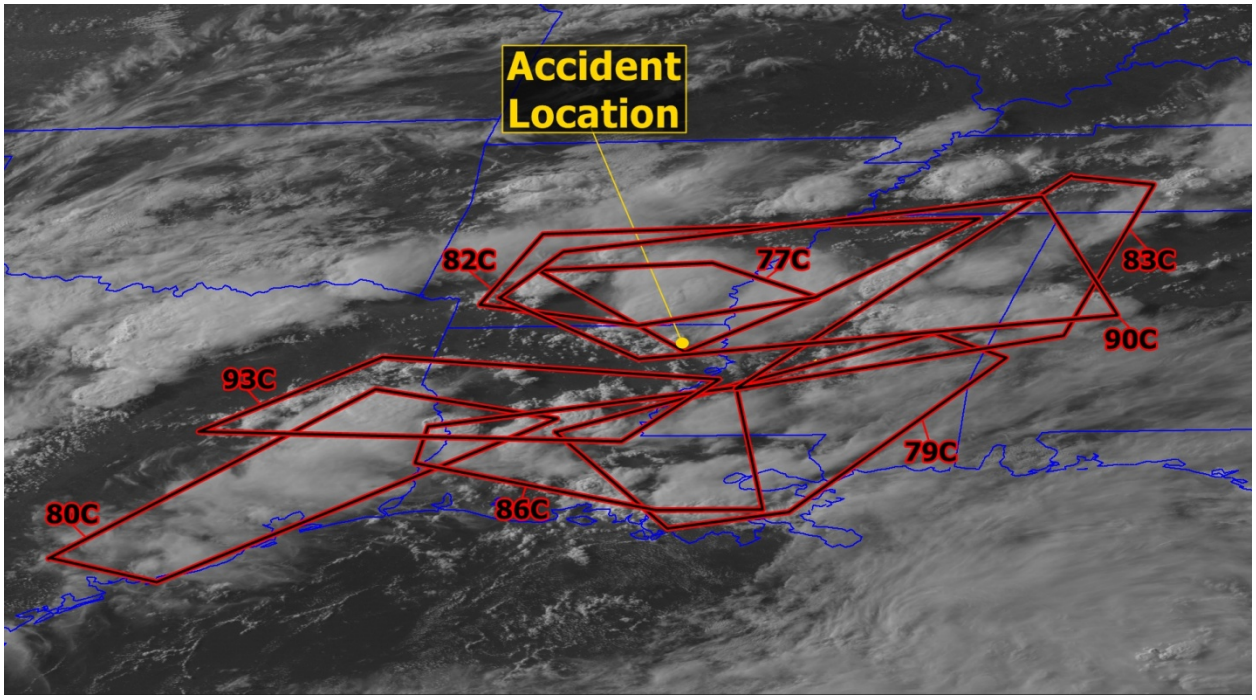

Figure 10 – Convective SIGMETs issued for accident region surrounding the times of the accident. Overlaid onto GOES-13 infrared (10.7µm) imagery from 1755 CDT.

WSUS32 KKCI 282255
SIGC
_MKCC WST 282255

CONVECTIVE SIGMET 90C
VALID UNTIL 0055Z
TN AL MS LA AR
FROM 50NW MSL-40SSW VUZ-10SE MLU-20ENE TXK-50WSW LIT-50NW MSL
AREA TS MOV LTL. TOPS ABV FL450.

CONVECTIVE SIGMET 93C
VALID UNTIL 0055Z
MS LA TX
FROM 10NE GGG-50WSW JAN-40SE AEX-60ESE ACT-10NE GGG
AREA TS MOV FROM 13010KT. TOPS ABV FL450.

WSUS32 KKCI 282155
SIGC
_MKCC WST 282155

CONVECTIVE SIGMET 82C
VALID UNTIL 2355Z
MS LA AR
FROM 60W LIT-60NNW IGB-30ESE SQS-30N MLU-10E TXK-60W LIT
AREA SEV TS MOV FROM 26015KT. TOPS ABV FL450.
HAIL TO 1 IN...WIND GUSTS TO 50KT POSS.

CONVECTIVE SIGMET 83C
VALID UNTIL 2355Z
TN AL MS
FROM 60NNW MSL-50NNE MSL-60ENE MEI-40NNW MCB-60NNW MSL
AREA SEV TS MOV FROM 27015KT. TOPS ABV FL450.
HAIL TO 1 IN...WIND GUSTS TO 50KT POSS.

CONVECTIVE SIGMET 86C
VALID UNTIL 2355Z
MS LA TX
FROM 40SW JAN-20SSE HRV-50S BTR-40NW LCH-50E LFK-40SW JAN
AREA TS MOV FROM 11015KT. TOPS ABV FL450.

WSUS32 KKCI 282055
SIGC
_MKCC WST 282055

CONVECTIVE SIGMET 77C
VALID UNTIL 2255Z
MS LA AR
FROM 50SE LIT-10NW SQS-30E MLU-50NE TXK-50SE LIT
AREA SEV TS MOV LTL. TOPS ABV FL450.
HAIL TO 1 IN...WIND GUSTS TO 50KT POSS.

CONVECTIVE SIGMET 79C
VALID UNTIL 2255Z
AL MS LA AND MS LA CSTL WTRS
FROM 30NNW MEI-30E MEI-30SE HRV-50WNW LEV-20SSW AEX-30NNW MEI
AREA SEV TS MOV FROM 13015KT. TOPS ABV FL450.
HAIL TO 1 IN...WIND GUSTS TO 50KT POSS.

CONVECTIVE SIGMET 80C
VALID UNTIL 2255Z
LA TX AND TX CSTL WTRS
FROM 30SSE GGG-10WSW AEX-20ESE PSX-50WNW PSX-30SSE GGG
AREA TS MOV LTL. TOPS ABV FL450.

9.0 Convective Outlooks

A Convective Outlook was issued at 1452 CDT and valid for the time period: 1500 CDT June 28 – 0700 CDT June 29. A graphical depiction of the outlook is presented in figure 10.

SPC AC 281952

DAY 1 CONVECTIVE OUTLOOK
NWS STORM PREDICTION CENTER NORMAN OK
0252 PM CDT MON JUN 28 2010

VALID 282000Z - 291200Z

...THERE IS A SLGT RISK OF SVR TSTMS ACROSS PARTS OF SRN NEW ENGLAND...THE CNTRL APPALACHIAN MTNS AND MID-ATLANTIC...

ONLY TWO CHANGES HAVE BEEN MADE FOR THE 20Z OUTLOOK. THE FIRST IS TO TRIM THE SLIGHT RISK AREA ON THE WRN EDGE MAINLY IN WV WHERE DESTABILIZATION IS WEAKER THAN AREAS TO THE EAST. FOR MORE DETAILS CONCERNING THE SEVERE THREAT WITHIN THE SLIGHT RISK AREA...SEE MCD 1156. THE SECOND CHANGE IS TO TRIM THE WRN EDGE OF THE THUNDERLINE AND LOW-END PROBABILITIES TO THE EAST IN THE GREAT LAKES AND OH VALLEY WHERE THUNDERSTORM DEVELOPMENT APPEARS LESS LIKELY DUE TO A COLD FRONT MOVING SEWD ACROSS THE REGION.

..BROYLES.. 06/28/2010

The applicable portion of the previous discussion referenced in the above narrative:

...SRN APPALACHIANS TO CENTRAL/E TX THIS AFTERNOON...
A COLD FRONT WILL SAG SEWD ACROSS KY/TN/AR/SE OK THROUGH THE AFTERNOON. STRONG SURFACE HEATING S OF THE FRONT WILL AGAIN CONTRIBUTE TO MODERATE AFTERNOON INSTABILITY IN AN ENVIRONMENT OF WEAK VERTICAL SHEAR AND BOUNDARY LAYER DEWPOINTS IN THE 70S. THUS...PROFILES WILL BE FAVORABLE FOR PULSE-TYPE STORMS WITH THE POTENTIAL FOR ISOLATED STRONG DOWNBURST WINDS ALONG THE FRONT...AS WELL AS WITH THE OUTFLOW-ASSISTED SEA BREEZE ACROSS THE GULF COAST AND THE HIGHER TERRAIN OF THE SRN APPALACHIANS THIS AFTERNOON.

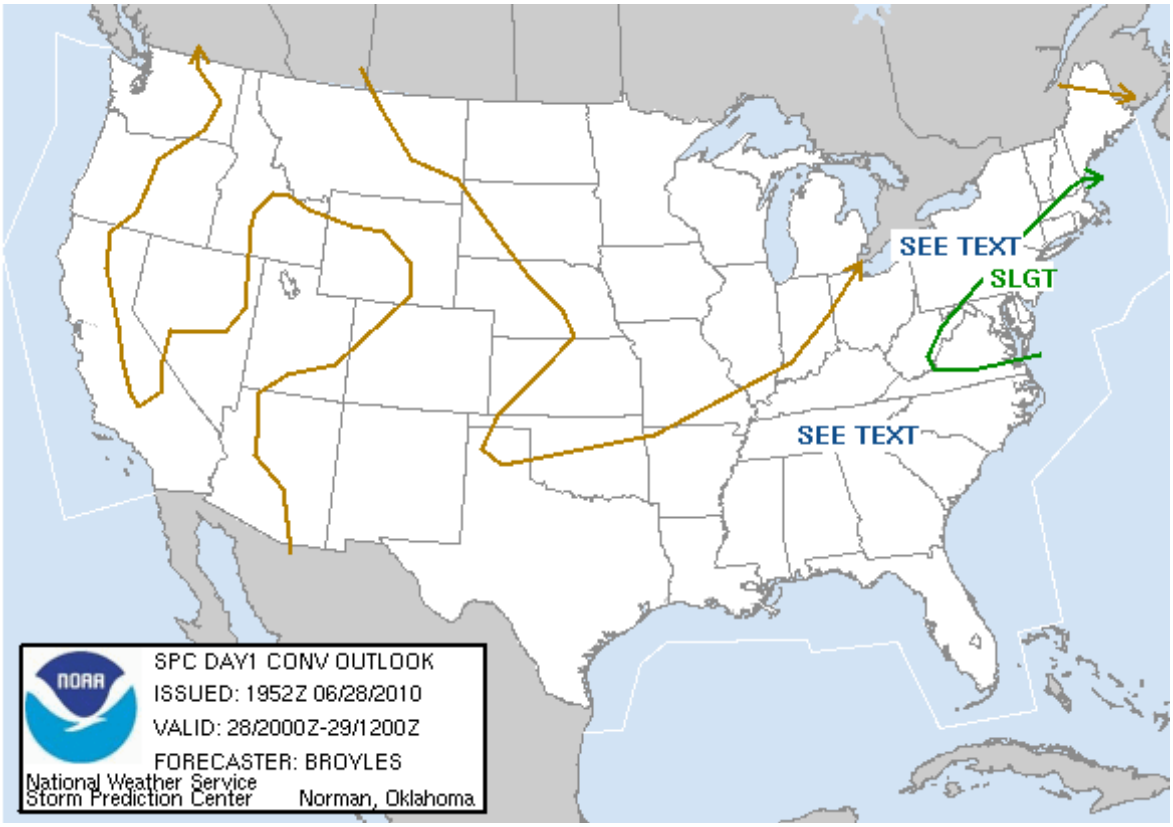

Figure 10 – Convective Outlook issued at 11452 CDT.

10.0 Severe Thunderstorm/Tornado Watches and Warnings

A severe thunderstorm warning was issued for southern West Carroll Parish (the location of the accident) in Louisiana at 1750 CDT (approximate accident time).

WUUS54 KJAN 282250
SVRJAN
LAC123-282330-
/O.NEW.KJAN.SV.W.0331.100628T2250Z-100628T2330Z/
BULLETIN - EAS ACTIVATION REQUESTED
SEVERE THUNDERSTORM WARNING
NATIONAL WEATHER SERVICE JACKSON MS
550 PM CDT MON JUN 28 2010
THE NATIONAL WEATHER SERVICE IN JACKSON HAS ISSUED A
* SEVERE THUNDERSTORM WARNING FOR...
SOUTHERN WEST CARROLL PARISH IN NORTHEAST LOUISIANA...
* UNTIL 630 PM CDT
* AT 550 PM CDT...NATIONAL WEATHER SERVICE METEOROLOGISTS DETECTED A SEVERE THUNDERSTORM CAPABLE OF PRODUCING QUARTER SIZE HAIL...AND DAMAGING WINDS IN EXCESS OF 60 MPH. THIS STORM WAS LOCATED NEAR DARNELL MOVING NORTH AT 10 MPH.

* OTHER LOCATIONS IN THE WARNING INCLUDE BUT ARE NOT LIMITED TO GOODWILL AND OAK GROVE PRECAUTIONARY/PREPAREDNESS ACTIONS...
WINDS OF 60 MPH CAN BRING DOWN TREES...POSSIBLY RESULTING IN INJURY AND PROPERTY DAMAGE. ROOFS OF MOBILE HOMES AND OUTBUILDINGS COULD BE DAMAGED...AND MINOR ROOF DAMAGE TO WELL BUILT HOMES AND STRUCTURES COULD OCCUR.
&&
LAT...LON 3276 9158 3279 9160 3280 9158 3286 9156
3288 9153 3289 9149 3290 9134 3261 9142
3259 9159 3267 9159 3268 9162 3273 9162
TIME...MOT...LOC 2250Z 172DEG 7KT 3269 9154
$$
GARRETT

11.0 Mesoscale Discussions

No Mesoscale Discussions were issued for the Louisiana/Arkansas/Mississippi area on the day of the turbulence event.

12.0 Severe Storm Reports

The NWS did not receive any severe storm reports for the immediate area of the turbulence event near event time.

13.0 Meteorological Impact Statements/Center Weather Advisories

A Meteorological Impact Statement (MIS) was issued for ZME airspace at 1634 CDT and was valid until 2300 CDT. This MIS advised of thunderstorms south of a line from TXK (Texarkana, Texas) to MEM (Memphis, Tennessee) to LVT (Livingston, Tennessee).

FAUS20 KZME 282134
ZME MIS COR 02 VALID 282130-290400
...FOR ATC PLANNING PURPOSES ONLY...
FOR ZME S OF A LINE FM MLC TO ARG TO LVT
SCT TS CONT MOV S OF A LINE FM TXK TO MEM TO LVT AFT 01Z. TS EXPECTED TO CONT TO FORM IN SHORT LINES AND CLUSTERS. MOV LTL SRN MS/SRN AR...ELSEWHERE EXPECT STORM MOTION FM 28015KT. MAX TOPS AOA FL450.

14.0 Astronomical Data

The astronomical data obtained from NOAA for the accident location indicated the following for June 28, 2010:

SUN

Apparent Sunrise	0434
Solar Noon	1204
Apparent Sunset	1934

Mike Richards
NTSB Meteorologist