



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Washington, D.C. 20594

August 7, 2017

Weather Study

METEOROLOGY

CEN15FA388

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A. AIRCRAFT ACCIDENT

Location: Kewanee, Illinois
Date: August 30, 2015
Time: about 0918 central daylight time
1418 coordinated universal time (UTC)
Airplane: Cirrus SR22; Registration: N765CD

B. METEOROLOGIST

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C. SUMMARY

On August 30, 2015, about 0918 central daylight time, a Cirrus SR22 airplane, N765CD, registered to private individuals, collided with terrain shortly after takeoff from the Kewanee Municipal Airport (EZI), Kewanee, Illinois. Of the three occupants, the private pilot and 1 passenger sustained fatal injuries and 1 passenger sustained serious injuries. The flight was being conducted under the provisions of Federal Code of Regulations Part 91. Instrument meteorological conditions prevailed throughout the area of the accident and an IFR flight plan was placed on file with a 10 minute void time prior to takeoff. The flight was originating from EZI with an intended destination of Hot Springs, Arkansas.

D. DETAILS OF THE INVESTIGATION

The National Transportation Safety Board's (NTSB) Senior Meteorologist was not on scene for this investigation and conducted the meteorology phase of the investigation from the Washington D.C. office, collecting data from official National Weather Service (NWS) sources including the Weather Prediction Center (WPC) and the National Center for Environmental Information (NCEI). All times are central daylight time (CDT) based upon the 24 hour clock, local time is +5 hours to UTC¹, and UTC=Z. Directions are referenced to true north and distances in nautical miles. Heights are above mean sea level (msl) unless otherwise noted. Visibility is in statute miles and fractions of statute miles.

The accident site was estimated by the FAA air traffic control radar plots at latitude 41°12'19.81" N and longitude 89°59'48.05" W, at an elevation of 840 feet (ft).

¹ UTC – is an abbreviation for Coordinated Universal Time.

E. FACTUAL INFORMATION

1.0 Synoptic Situation

The synoptic or large scale migratory weather systems influencing the area were documented using standard NWS charts issued by the National Center for Environmental Prediction (NCEP) located in Camp Springs, Maryland. These are the base products used in describing weather features and in the creation of forecasts and warnings. Reference to these charts can be found in the joint NWS and Federal Aviation Administration (FAA) Advisory Circular “Aviation Weather Services”, AC 00-45H.

1.1 Surface Analysis Chart

The northcentral portion of the NWS Surface Analysis Chart for 1000 CDT on August 30, 2015 based on the 0950 CDT observations immediately after the accident is included as figure 1 with the accident site marked by a red star. The chart depicted a dissipating stationary front extending from western Indiana, central Illinois, southwestward across Missouri and into Oklahoma to a low pressure system at 1014-hectopascals (hPa). To the north over southern Wisconsin a high pressure system at 1020-hPa was located with another high to the east-southeast over Virginia at 1022-hPa was located, and produced a weak pressure gradient over the region. The station models depicted overcast sky cover and visibilities restricted in fog or mist along and north of the front over Kansas, northern Missouri and Illinois, Iowa, Nebraska, Minnesota, Wisconsin, into Michigan.

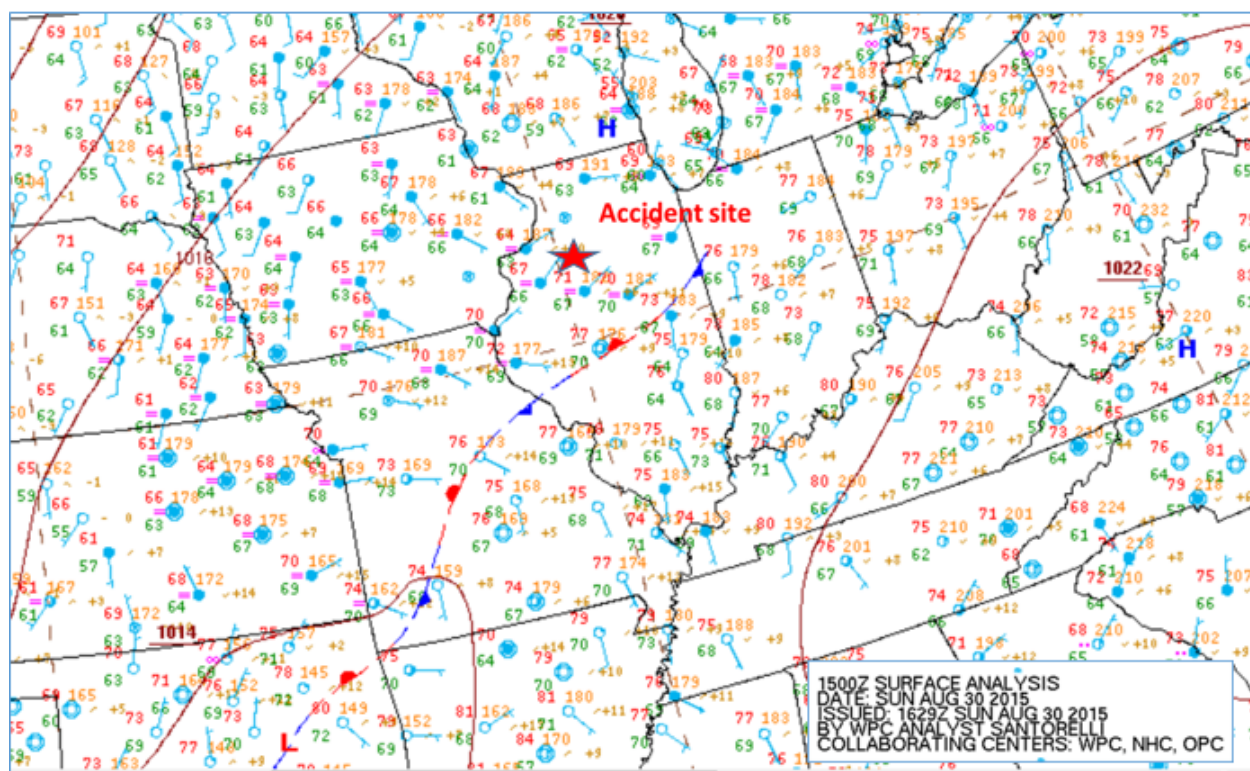


Figure 1 - Northcentral portion of the NWS Surface Analysis Chart for 1000 CDT

1.2 Weather Depiction Chart

The northcentral portion of the NWS Weather Depiction Chart for 0800 CDT (1300Z) depicting the general flight conditions² is included as figure 2. The chart depicted a stationary front over the region with an area of instrument flight rule (IFR) conditions by a shaded contour line extending north of the front over Kansas, Missouri, eastern Nebraska, Iowa, Minnesota, northern Illinois, Wisconsin, Indiana, and Michigan. Surrounding that area an unshaded contour depicting marginal visual flight rule (MVFR) conditions. Visual flight rule (VFR) conditions were depicted without a contour and were depicted over southern Illinois, Missouri, and Arkansas. The station model surrounding the accident site depicted surface based obscurations with visibility 1/4 mile in dense fog.

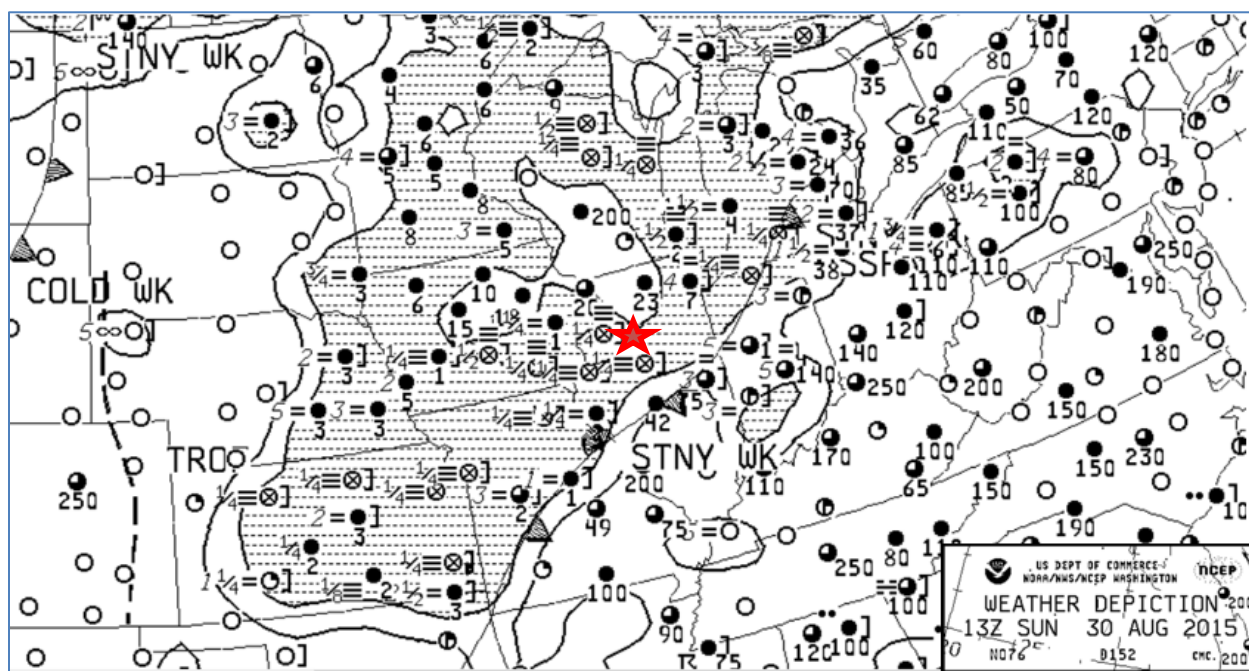


Figure 2 - NWS Weather Depiction Chart for 0800 CDT depicting the general flight categories

1.3 National Weather Radar Composite

The NWS National Weather Radar Mosaic for 0915 CDT over central Illinois is included as figure 3, with the accident marked by the red star. The image depicted a small 5 mile area of very

² As defined by the NWS and the FAA Aeronautical Information Manual (AIM) section 7-1-7 defines the following general flight categories:

- Low Instrument Flight Rules (LIFR*) – ceiling or lowest layer of clouds reported as broken, overcast or the vertical visibility into a surface based obscuration below 500 feet agl and/or visibility less than 1 statute mile.
- Instrument Flight Rules (IFR) – ceiling between 500 to below 1,000 feet agl and/or visibility 1 to less than 3 miles.
- Marginal Visual Flight Rules (MVFR**) – ceiling from 1,000 to 3,000 feet agl and/or visibility 3 to 5 miles.
- Visual Flight Rules (VFR) – ceiling greater 3,000 feet agl and visibility greater than 5 miles.

* By definition, IFR is a ceiling less than 1,000 feet agl and/or visibility less than 3 miles while LIFR is a sub-category of IFR.

**By definition, VFR is a ceiling greater than or equal to 3,000 feet agl and visibility greater than 5 miles while MVFR is a sub-category of VFR.

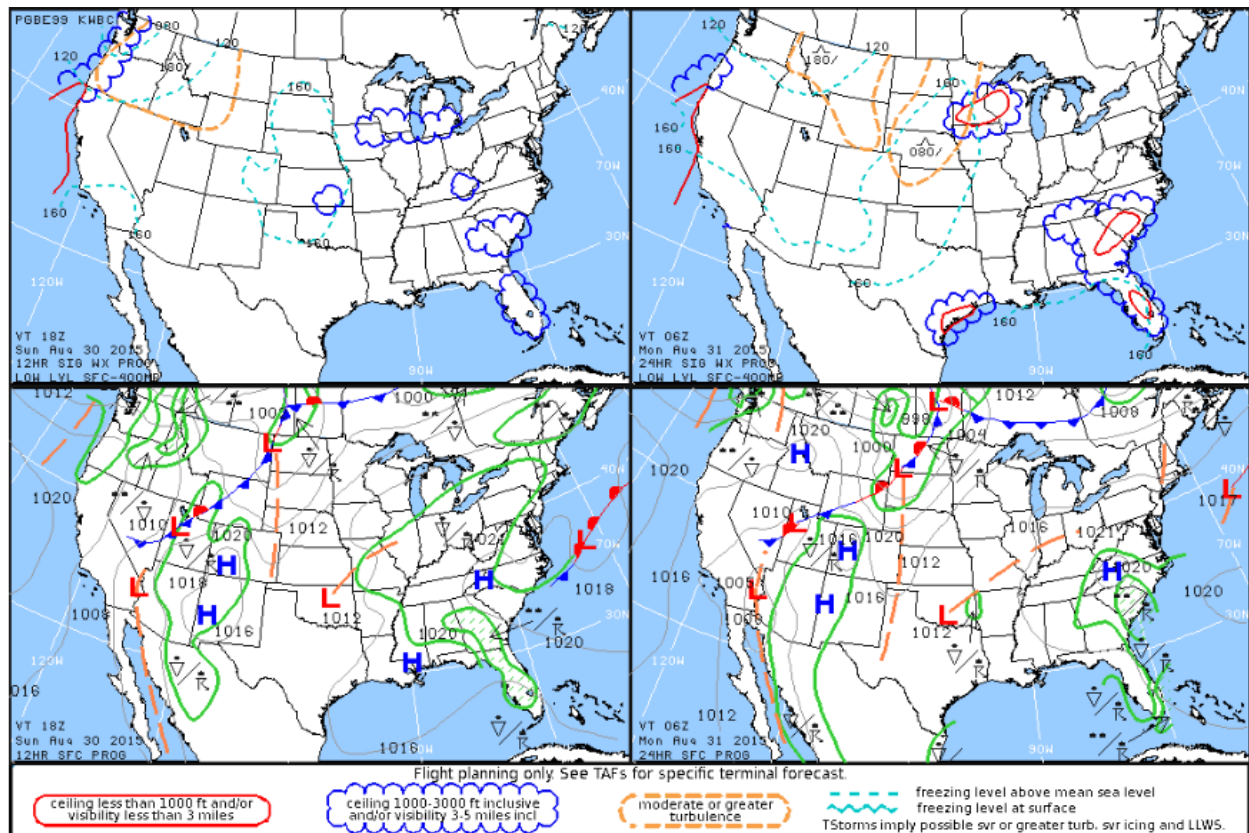
Radar Data Map

Radar Mosaic: 2015/08/30 14:15 UTC

Map showing radar reflectivity (dBZ) over a region in Iowa. The map includes major highways (I-74, I-180, US-34, US-81, US-5, US-78, US-93, US-167, US-750) and cities/towns (Orion, Osco, Sherrard, Lynn Center, Andover, New Windsor, Alpha, Woodhull, North Handerson, Henderson, Wataga, East Galesburg, Knoxville, Cameron, Galesburg Muni Airport, Kewanee, Kewanee Muni Airport, Galva, Lafayette, Altona, Oneida, Victoria, Dahinda, Laura, Princeville, Edelstein, Chillicothe, Rome, Sparland, Marsh Co Air, Putnam, Bradford, Castleton, Camp Grove, Wyoming, Buda, Sheffield, Wyanet, Tiskilwa, Mineral, Atkinson). A red star marks the Kewanee Muni Airport. A color scale at the bottom indicates reflectivity (dBZ) from -20 to 80. A scale bar shows distances in kilometers (0 to 10 km) and miles (0 to 6 mi).

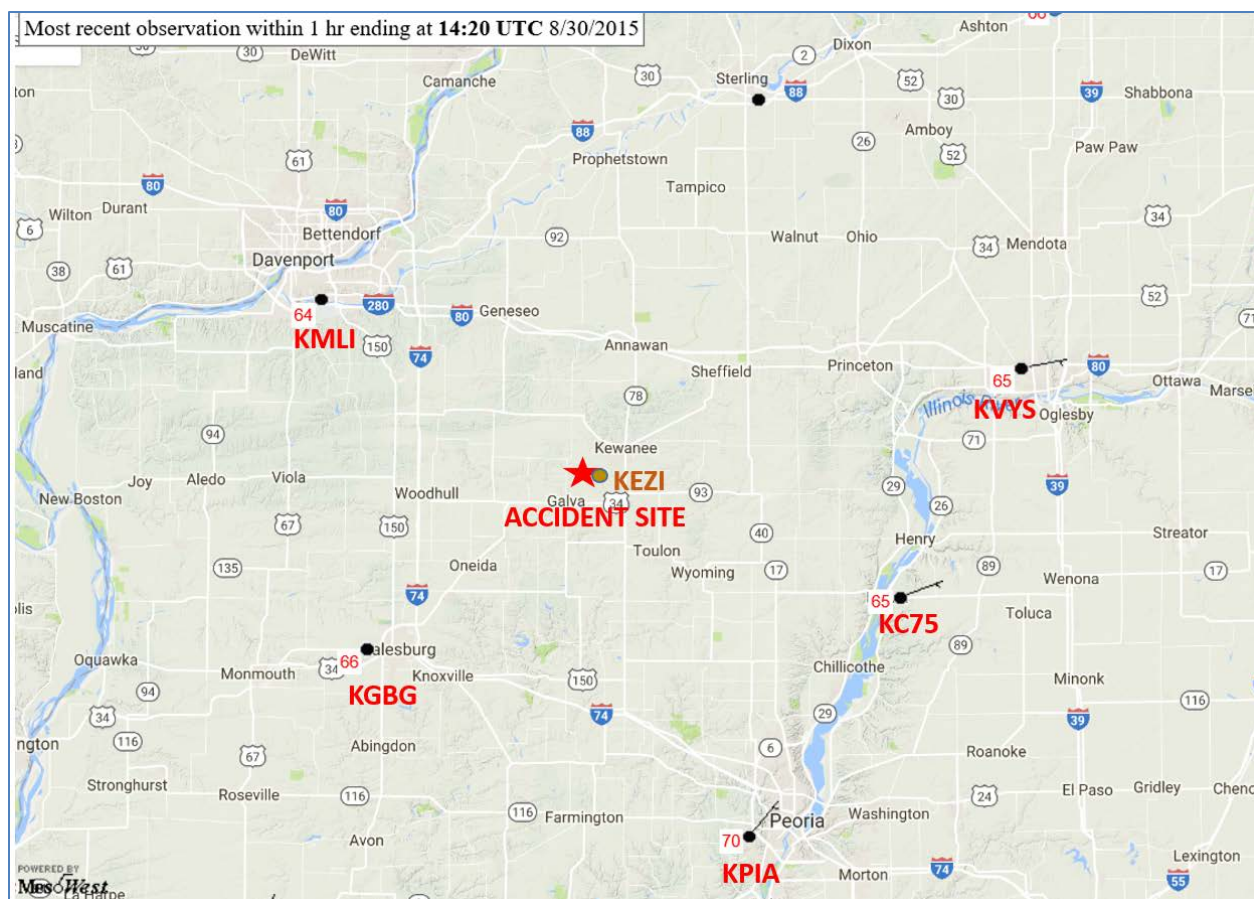
Since echoes were identified in the immediate vicinity, the closest NWS weather radar will be further documented in section 5.0 of this report.

The Low-Level Significant Weather Prognostic Chart valid for the period provided a 12- and 24-hour forecast of the surface pressure systems and related frontal zones, forecast precipitation, with the top portion of the chart the forecast flight conditions and freezing levels and is included as figure 4. The 12-hour forecast on the left depicted the expected conditions at 1300 CDT with a the low pressure system over Oklahoma with the stationary front having dissipated and becoming a trough. Widely scattered rain showers and thunderstorms were expected along and south of the trough with general VFR conditions prevailing at 1300 CDT along the route of flight.



2.0 Surface Observations

The surrounding area was documented utilizing the official NWS Meteorological Aerodrome Reports (METARs) and special reports (SPECIs). Figure 5 is a Google map from MesoWest plotted immediately after the accident with wind and temperature plotted. The image documents the closest weather reporting stations listed below. The cloud heights are reported above ground level (agl) in the following observations. The magnetic variation over the area was estimated at 2° West.



2.1 Kewanee, Illinois

The accident airplane departed from Kewanee Municipal Airport (KEZI), Kewanee, Illinois (IL) with an elevation of 858 ft about 0914 CDT. The airport lists no official weather reporting capability; however, an unofficial weather station (DW7642) was collocated at the airport and reported the following conditions immediately prior to the accident aircrafts departure:

Kewanee weather at 0910 CDT, wind from 090° at 1 knot, visibility, weather, and sky condition not reported, temperature 66° Fahrenheit (F) (18.9° Celsius (C)), dew point 65.7° F (18° C), relative humidity 99%, altimeter 30.11 inches of mercury (Hg).

The raw observation data surrounding the period was as follows:

TIME (UTC)	Altimeter (" Hg)	T (°F)	Td (°F)	RH(%)	Wind	Wind Speed (mph)	Gusts (mph)	Precip (inch)
0900Z	30.06	66	65	98		0	0	0
0910Z	30.06	65	64	97		0	0	0
0950Z	30.06	65	65	99	N	5	5	0
1010Z	30.06	66	66	99	N	6	9	0
1020Z	30.06	66	66	99	N	2	8	0
1140Z	30.08	66	66	99	NNE	5	7	0
1200Z	30.09	66	66	99	NNE	5	7	0
1230Z	30.09	65	65	99	NNE	5	9	0
1240Z	30.09	65	65	99	NE	6	8	0
1310Z	30.1	65	65	99	NE	6	7	0
1320Z	30.1	65	65	99	NE	4	8	0
1410Z	30.11	66	66	99	E	2	6	0
1450Z	30.11	67	67	99	E	2	5	0
1500Z	30.12	68	68	99	E	3	5	0
1530Z	30.12	68	67	98		0	3	0
1640Z	30.12	73	69	86		0	4	0

2.2 Galesburg, IL

The closest reporting station to the accident site was from Galesburg Municipal Airport (KGBG), Galesburg, IL, located 28 miles southwest of the accident site at an elevation of 764 ft. The airport had an Automated Weather Observation System (AWOS), which issued observations every 20-minutes. The following conditions were reported at the time of the accident:

Galesburg Municipal Airport weather at 0915 CDT, automated, wind calm, visibility 1 miles in mist, ceiling overcast at 200 ft, temperature and dew point 19° C, altimeter 30.09 inches of Hg.

A review of the observations for the day indicated that IFR conditions were reported as early as 2215 CDT on August 29 with low ceilings and visibility in fog and mist continuing through the time of the accident and clearing by 1115 CDT. The raw observations with time reference to UTC and general flight categories reported surrounding the period were as follows:

LIFR METAR KGBG 300955Z AUTO 35003KT M1/4SM FG OVC002 17/17 A3003 RMK AO2 T01700168
LIFR METAR KGBG 301015Z AUTO 35003KT M1/4SM FG OVC002 18/18 A3004 RMK AO2 T01760175
LIFR METAR KGBG 301035Z AUTO 36003KT M1/4SM RA OVC002 18/18 A3003 RMK AO2 T01760175
LIFR METAR KGBG 301055Z AUTO 00000KT M1/4SM -DZ OVC002 18/17 A3004 RMK AO2 T01750173=
LIFR METAR KGBG 301115Z AUTO 36005KT 1/4SM -DZ OVC002 17/17 A3004=
LIFR METAR KGBG 301135Z AUTO 02004KT M1/4SM -DZ OVC002 17/17 A3006=
LIFR METAR KGBG 301155Z AUTO 04004KT M1/4SM -DZ OVC002 17/17 A3006 RMK AO2 LTG DSNT S
T01720170 10193 20167=
LIFR METAR KGBG 301215Z AUTO 03004KT M1/4SM -DZ OVC002 17/17 A3006=
LIFR METAR KGBG 301235Z AUTO 00000KT M1/4SM -DZ OVC002 17/17 A3007=
LIFR METAR KGBG 301255Z AUTO 03003KT M1/4SM -DZ OVC002 18/17 A3007 RMK AO2 T01750173=

LIFR METAR KGBG 301315Z AUTO 00000KT 1/2SM FG OVC002 18/18 A3008 RMK AO2 T01770175
 LIFR METAR KGBG 301335Z AUTO 00000KT 1 3/4SM BR OVC002 18/18 A3008 RMK AO2 T01800178
 LIFR METAR KGBG 301355Z AUTO 05003KT 2 1/2SM BR OVC002 19/18 A3008 RMK AO2 T01850182
LIFR METAR KGBG 301415Z AUTO 00000KT 1SM BR OVC002 19/19 A3009 RMK AO2 T01880186
Accident 1418Z
 LIFR METAR KGBG 301435Z AUTO 03003KT 1 3/4SM BR OVC002 19/19 A3009 RMK AO2 T01900187
 LIFR METAR KGBG 301455Z AUTO 05003KT 2 1/2SM BR OVC002 19/19 A3009 RMK AO2 T01940191
 LIFR METAR KGBG 301515Z AUTO 36003KT 4SM BR OVC004 20/19 A3009 RMK AO2 T01990194
 LIFR METAR KGBG 301535Z AUTO 01003KT 4SM BR OVC004 20/19 A3010 RMK AO2 T02010192
 IFR METAR KGBG 301555Z AUTO 00000KT 7SM BKN006 21/20 A3010 RMK AO2 T02130195
 VFR METAR KGBG 301615Z AUTO 35004KT 7SM SCT008 23/20 A3009 RMK AO2 T02250198 PNO
 VFR METAR KGBG 301635Z AUTO 35003KT 10SM SCT010 24/20 A3009 RMK AO2 T02350200

2.3 Lacon, IL

The next closest weather reporting location to the accident site was from Marshall County Airport (KC75), Lacon, IL about 30 miles southeast of the accident site at an elevation of 585 ft. The airport had an AWOS and reported the following conditions:

Marshall County Airport weather at 0915 CDT, automated, wind from 070° at 4 knots, visibility 1 ¾ miles in mist, ceiling overcast at 100 ft, temperature 19° C, dew point 18° C, altimeter 30.07 inches of Hg.

A review of the observations indicated IFR conditions forming around 0330 CDT and continuing through the time of the accident and clearing to VFR conditions by 1415 CDT. The raw observations and general flight categories reported surrounding the period were as follows:

LIFR METAR KC75 300915Z AUTO 00000KT 3/4SM BR BKN001 BKN005 BKN070 17/16 A3002 RMK AO2
 T01700164
 LIFR METAR KC75 300935Z AUTO 00000KT 1/4SM FG OVC001 17/16 A3002 RMK AO2 T01690164
 LIFR METAR KC75 300955Z AUTO 00000KT 1 3/4SM BR OVC003 17/16 A3001 RMK AO2 T01680163
 LIFR METAR KC75 301015Z AUTO 00000KT 3SM BR OVC001 17/16 A3002 RMK AO2 T01660160
 LIFR METAR KC75 301035Z AUTO 00000KT M1/4SM FG OVC001 18/17 A3002 RMK AO2 T01790174
 LIFR METAR KC75 301055Z AUTO 00000KT 1/4SM FG OVC001 18/18 A3003 RMK AO2 T01820177
 LIFR METAR KC75 301115Z AUTO 00000KT 1/2SM FG OVC001 19/18 A3003 RMK AO2 T01850180
 LIFR METAR KC75 301135Z AUTO 35003KT 1/4SM FG OVC001 19/18 A3004 RMK AO2 T01860181
 LIFR METAR KC75 301155Z AUTO 00000KT M1/4SM FG OVC001 19/18 A3005 RMK AO2 T01850180
 10205 20166
 LIFR METAR KC75 301215Z AUTO 02003KT M1/4SM -RA OVC001 18/18 A3005 RMK AO2 T01830178
 LIFR METAR KC75 301255Z AUTO 00000KT 1/4SM FG OVC001 18/18 A3006 RMK AO2 T01840179
 LIFR METAR KC75 301315Z AUTO 00000KT 1/4SM FG OVC001 19/18 A3006 RMK AO2 T01850180
 LIFR METAR KC75 301335Z AUTO 05003KT 1/2SM FG OVC001 18/18 A3007 RMK AO2 T01840179
 LIFR METAR KC75 301355Z AUTO 00000KT 1 1/4SM BR OVC001 18/18 A3007 RMK AO2 T01830178
LIFR METAR KC75 301415Z AUTO 07004KT 1 3/4SM BR OVC001 19/18 A3007 RMK AO2 T01860181
Accident 1418Z
 LIFR METAR KC75 301435Z AUTO 08003KT 1 3/4SM BR OVC001 19/18 A3007 RMK AO2 T01880183
 LIFR METAR KC75 301455Z AUTO 00000KT 1 3/4SM BR OVC003 19/18 A3008 RMK AO2 T01880183
 LIFR METAR KC75 301515Z AUTO 00000KT 1 3/4SM BR OVC003 19/18 A3008 RMK AO2 T01900184
 LIFR METAR KC75 301535Z AUTO 00000KT 4SM BR OVC003 19/18 A3009 RMK AO2 T01910183
 LIFR METAR KC75 301555Z AUTO 00000KT 4SM BR OVC003 19/18 A3009 RMK AO2 T01920183
 IFR METAR KC75 301615Z AUTO 00000KT 5SM BR OVC005 20/18 A3009 RMK AO2 T01950182
 IFR METAR KC75 301635Z AUTO 00000KT 5SM BR OVC005 20/19 A3009 RMK AO2 T01960186

IFR METAR KC75 301655Z AUTO 00000KT 7SM OVC007 20/19 A3009 RMK AO2 T02000186
 IFR METAR KC75 301715Z AUTO 00000KT 5SM BR OVC009 20/19 A3008 RMK AO2 T02000185
 IFR METAR KC75 301735Z AUTO 00000KT 7SM OVC007 20/19 A3008 RMK AO2 T02010186
 IFR METAR KC75 301755Z AUTO 00000KT 7SM BKN009 OVC014 20/19 A3008 RMK AO2 T02010185
 10202 20183
 MVFR METAR KC75 301815Z AUTO 00000KT 7SM SCT007 BKN014 BKN021 22/19 A3007 RMK AO2
 T02180192
 MVFR METAR KC75 301835Z AUTO 00000KT 10SM SCT019 BKN026 BKN100 22/19 A3007 RMK AO2
 T02200185

2.4 Moline, IL

Quad City International Airport (KMLI), located in Moline, IL about 28 miles northwest of the accident site at an elevation of 590 ft had an Automated Surface Observation System (ASOS) and was augmented by NWS certified observers. The following condition was reported at the time of the accident:

Quad City International Airport special weather observation at 0914 CDT, wind calm, visibility 1/2 mile in fog, runway 9 visual range (RVR) from 1,400 ft variable 4,500 ft, vertical visibility 200 ft, temperature 18° C, dew point 17° C, altimeter 30.08 inches of Hg.

A review of the observations indicated similar conditions with IFR condition due to low ceilings and visibility developing during the early morning hours and clearing after 1124 CDT. The raw observations and flight categories were as follows:

LIFR SPECI KMLI 300925Z 00000KT 1/4SM R09/0700V1200FT FG VV002 16/15 A3003 RMK AO2
 LIFR METAR KMLI 300952Z 00000KT 1/4SM R09/1000V1400FT FG VV002 16/15 A3004 RMK AO2 SLP169
 T01610150
 LIFR METAR KMLI 301052Z 00000KT 1/4SM R09/0800V1000FT FG VV002 17/16 A3005 RMK AO2 SLP172
 T01670156
 LIFR METAR KMLI 301152Z 00000KT M1/4SM R09/0600V0700FT FG VV002 17/16 A3006 RMK AO2
 SLP175 70001 T01720161 10172 20150 52009
 LIFR METAR KMLI 301252Z 09006KT M1/4SM R09/0800V1200FT FG VV002 17/16 A3007 RMK AO2 SLP179
 T01720161
 LIFR METAR KMLI 301352Z 07004KT 1/4SM R09/1200V1600FT FG VV002 17/17 A3008 RMK AO2 SLP184
 T01720167
LIFR SPECI KMLI 301414Z 00000KT 1/2SM R09/1600V4500FT FG VV002 18/17 A3008 RMK AO2
Accident 1418Z
 LIFR SPECI KMLI 301434Z 08005KT 1 1/2SM R09/3500VP6000FT BR OVC002 18/17 A3008 RMK AO2
 VIS 3/4V3 T01780167
 LIFR SPECI KMLI 301441Z 07003KT 2 1/2SM BR OVC002 18/17 A3008 RMK AO2 VIS 1 3/4V4
 LIFR METAR KMLI 301452Z 07003KT 2 1/2SM BR OVC003 18/17 A3009 RMK AO2 SLP187 T01780172
 51010
 LIFR SPECI KMLI 301501Z VRB04KT 5SM BR OVC003 18/17 A3009 RMK AO2 T01830172
 LIFR METAR KMLI 301452Z 07003KT 2 1/2SM BR OVC003 18/17 A3009
 IFR SPECI KMLI 301547Z 00000KT 7SM OVC005 20/18 A3010 RMK AO2
 IFR METAR KMLI 301552Z 00000KT 5SM BR OVC005 20/18 A3010 RMK AO2 SLP191 T02000178
 VFR SPECI KMLI 301624Z 06003KT 10SM SCT007 22/18 A3009 RMK AO2 T02170178
 VFR METAR KMLI 301652Z 00000KT 10SM CLR 23/18 A3009 RMK AO2 SLP186 T02330183

2.5 Peoria, IL

General Downing – Peoria Integrational Airport (KPIA), Peoria, IL, was located 35 miles south of the accident site at an elevation of 661 ft. The airport also had an ASOS and was augmented by NWS certified observers. The following conditions were reported at the time of the accident:

Peoria International Airport weather at 0854 CDT, wind from 040° at 5 knots, visibility 1 3/4 miles in mist, ceiling overcast at 200 ft, temperature 21° C, dew point 19° C, altimeter 30.07 inches of Hg.

A review of the observations indicated IFR conditions were also reported from 0544 CDT through 1220 CDT when MVFR conditions were reported. The raw observations and flight categories were as follows:

VFR METAR KPIA 300854Z 04003KT 6SM BR OVC043 22/19 A3002 RMK AO2 SLP161 T02170194 55000
MVFR METAR KPIA 300954Z 00000KT 4SM BR FEW055 21/19 A3002 RMK AO2 SLP161 T02110189
IFR SPECI KPIA 301044Z 00000KT 2 1/2SM BR CLR 21/19 A3002 RMK AO2 T02060189
IFR METAR KPIA 301054Z 00000KT 2 1/2SM BR FEW003 21/19 A3003 RMK AO2 SLP162 T02060189
LIFR SPECI KPIA 301107Z 05003KT 2SM BR BKN002 20/18 A3003 RMK AO2 T02000183
LIFR SPECI KPIA 301116Z 00000KT 1 1/4SM BR OVC002 21/18 A3004 RMK AO2 T02060183
LIFR SPECI KPIA 301124Z 03003KT 1/2SM R13/5000VP6000FT FG OVC002 21/19 A3004 RMK AO2
LIFR SPECI KPIA 301131Z 02003KT 1/8SM R13/2800VP6000FT FG VV002 21/19 A3004 RMK AO2
LIFR SPECI KPIA 301149Z 36003KT 1/8SM R13/1200V1400FT FG VV002 21/19 A3004 RMK AO2
LIFR METAR KPIA 301154Z 03003KT 1/8SM R13/1200V1400FT FG VV002 21/19 A3005 RMK AO2 SLP170
70001 T02060189 10222 20200 52008
LIFR SPECI KPIA 301227Z 03005KT M1/4SM R13/1600V2400FT FG VV002 21/19 A3005 RMK AO2
LIFR SPECI KPIA 301237Z 03004KT M1/4SM R13/1400V2200FT FG VV002 21/19 A3006 RMK AO2
LIFR METAR KPIA 301254Z 04004KT M1/4SM R13/1400V2000FT FG VV002 21/19 A3006 RMK AO2 SLP176
T02060194
LIFR SPECI KPIA 301302Z 04004KT M1/4SM R13/2000V4000FT FG VV002 21/19 A3006 RMK AO2
T02060194
LIFR SPECI KPIA 301347Z 04005KT 1/2SM R13/5500VP6000FT FG OVC002 21/19 A3007 RMK AO2
T02110194
LIFR METAR KPIA 301354Z 04005KT 1 3/4SM BR OVC002 21/19 A3007 RMK AO2 SLP179
Accident 1418Z
LIFR SPECI KPIA 301440Z 04003KT 1 1/4SM BR OVC002 21/19 A3008 RMK AO2 T02110194
LIFR SPECI KPIA 301451Z 04005KT 2SM BR OVC002 22/19 A3008 RMK AO2
LIFR METAR KPIA 301454Z 06005KT 2SM BR OVC002 22/19 A3008 RMK AO2 SLP182 T02170194 51006
LIFR METAR KPIA 301554Z 07004KT 3SM HZ OVC003 23/19 A3009 RMK AO2 SLP184 T02280189
IFR METAR KPIA 301654Z 04004KT 8SM OVC009 24/19 A3009 RMK AO2 SLP183 T02390194
MVFR SPECI KPIA 301720Z 00000KT 9SM OVC010 25/19 A3008 RMK AO2 T02500194
MVFR SPECI KPIA 301752Z 00000KT 10SM BKN015 27/19 A3007 RMK AO2
MVFR METAR KPIA 301754Z 00000KT 10SM BKN015 27/19 A3007 RMK AO2 SLP178 T02670194 10267
20206 57006
MVFR METAR KPIA 301854Z VRB04KT 10SM BKN019 BKN024 28/20 A3006 RMK AO2 SLP173 T02780200

2.6 Peru, IL

Illinois Valley Regional Airport-Walter A Duncan Field (KVYS), Peru, IL was located 38 miles east of the accident site at an elevation of 654 ft. The airport had an AWOS and reported the following conditions:

Illinois Valley Regional Airport weather at 0915 CDT, automated, wind from 080° at 5 knots, visibility 3/4 mile in mist, ceiling overcast at 200 ft, temperature 19° C, dew point 18° C, altimeter 30.09 inches of Hg.

The raw observations and flight categories were as follows:

LIFR METAR KVYS 300755Z AUTO 03003KT 2 1/2SM BR BKN004 BKN046 19/18 A3003 RMK AO2
T01870179=
LIFR METAR KVYS 300815Z AUTO 02004KT 2SM BR OVC002 19/18 A3002=
LIFR METAR KVYS 300835Z AUTO 04004KT 3/4SM BR OVC002 19/19 A3002=
LIFR METAR KVYS 300855Z AUTO 00000KT M1/4SM FG OVC002 19/18 A3003 RMK AO2 T01870182=
LIFR METAR KVYS 300915Z AUTO 02003KT M1/4SM FG OVC002 19/18 A3003=
LIFR METAR KVYS 300935Z AUTO 02003KT M1/4SM FG OVC002 19/18 A3003=
LIFR METAR KVYS 300955Z AUTO 04005KT M1/4SM FG OVC002 19/18 A3004 RMK AO2 T01860182=
LIFR METAR KVYS 301015Z AUTO 06005KT 1/4SM FG OVC002 19/18 A3004=
LIFR METAR KVYS 301035Z AUTO 04005KT 1/4SM FG OVC002 18/18 A3005=
LIFR METAR KVYS 301055Z AUTO 03005KT 1/4SM FG OVC002 18/18 A3005 RMK AO2 T01830180=
LIFR METAR KVYS 301115Z AUTO 04004KT 1/4SM FG OVC002 18/18 A3006=
LIFR METAR KVYS 301135Z AUTO 04004KT 1/4SM FG OVC002 18/18 A3007=
LIFR METAR KVYS 301155Z AUTO 04004KT 1/4SM FG OVC002 18/18 A3007 RMK AO2 T01830180 10195
20182=
LIFR METAR KVYS 301215Z AUTO 05004KT 1 1/4SM BR OVC002 18/18 A3007=
LIFR METAR KVYS 301235Z AUTO 03004KT 1 1/4SM BR OVC002 18/18 A3007=
LIFR METAR KVYS 301255Z AUTO 06003KT 3/4SM BR OVC002 18/18 A3008 RMK AO2 T01820179=
LIFR METAR KVYS 301315Z AUTO 03006KT 1/2SM FG OVC002 18/18 A3008=
LIFR METAR KVYS 301335Z AUTO 08004KT 1/4SM FG OVC002 18/18 A3009=
LIFR METAR KVYS 301355Z AUTO 05006KT 1/2SM FG OVC002 18/18 A3009 RMK AO2 T01830180=
LIFR METAR KVYS 301415Z AUTO 08005KT 3/4SM BR OVC002 19/18 A3009=
Accident 1418Z
LIFR METAR KVYS 301435Z AUTO 08004KT 1SM BR OVC002 19/18 A3009=
LIFR METAR KVYS 301455Z AUTO 08003KT 2SM BR OVC002 19/18 A3009 RMK AO2 T01870184=
LIFR METAR KVYS 301515Z AUTO 07003KT 3SM BR OVC004 19/19 A3010=
IFR METAR KVYS 301535Z AUTO 10003KT 3SM BR OVC006 19/18 A3010=
IFR METAR KVYS 301555Z AUTO 13004KT 4SM BR OVC006 20/18 A3010 RMK AO2 T01990181=
IFR METAR KVYS 301615Z AUTO 15003KT 5SM BR OVC008 20/18 A3010=
MVFR METAR KVYS 301635Z AUTO 17003KT 3SM BR OVC010 21/18 A3010=
MVFR METAR KVYS 301655Z AUTO 21003KT 4SM BR OVC012 21/18 A3010 RMK AO2 T02080181=
MVFR METAR KVYS 301715Z AUTO 00000KT 4SM HZ OVC012 21/18 A3010=
MVFR METAR KVYS 301735Z AUTO 14003KT 5SM HZ OVC012 21/18 A3009=
MVFR METAR KVYS 301755Z AUTO 17003KT 5SM HZ OVC014 22/18 A3009 RMK AO2 T02150178 10216
20181=
MVFR METAR KVYS 301815Z AUTO 18005KT 5SM HZ SCT014 SCT018 OVC026 22/18 A3009=
MVFR METAR KVYS 301835Z AUTO 16004KT 5SM HZ SCT012 OVC026 22/18 A3008=
MVFR METAR KVYS 301855Z AUTO 16004KT 7SM BKN026 24/18 A3008 RMK AO2 T02390183=
MVFR METAR KVYS 301915Z AUTO 15003KT 7SM SCT017 BKN026 23/18 A3007=
MVFR METAR KVYS 301935Z AUTO 14004KT 10SM BKN021 OVC028 24/18 A3007=
MVFR METAR KVYS 301955Z AUTO 13003KT 10SM BKN021 OVC026 24/18 A3006 RMK AO2 T02410178=

3.0 Sounding

The closest upper air sounding or rawinsonde observation (RAOB) was from the NWS Lincoln, IL Weather Forecast Office (WFO), site number 74560, location about 70 miles south-southeast of the accident site, at an elevation of 584 ft. The 0700 CDT (1200Z) morning sounding prior to

the accident was plotted on a standard Skew-T log P diagram³ from the surface to 500-hPa or 18,000 ft utilizing RAOB software⁴ as figure 6.

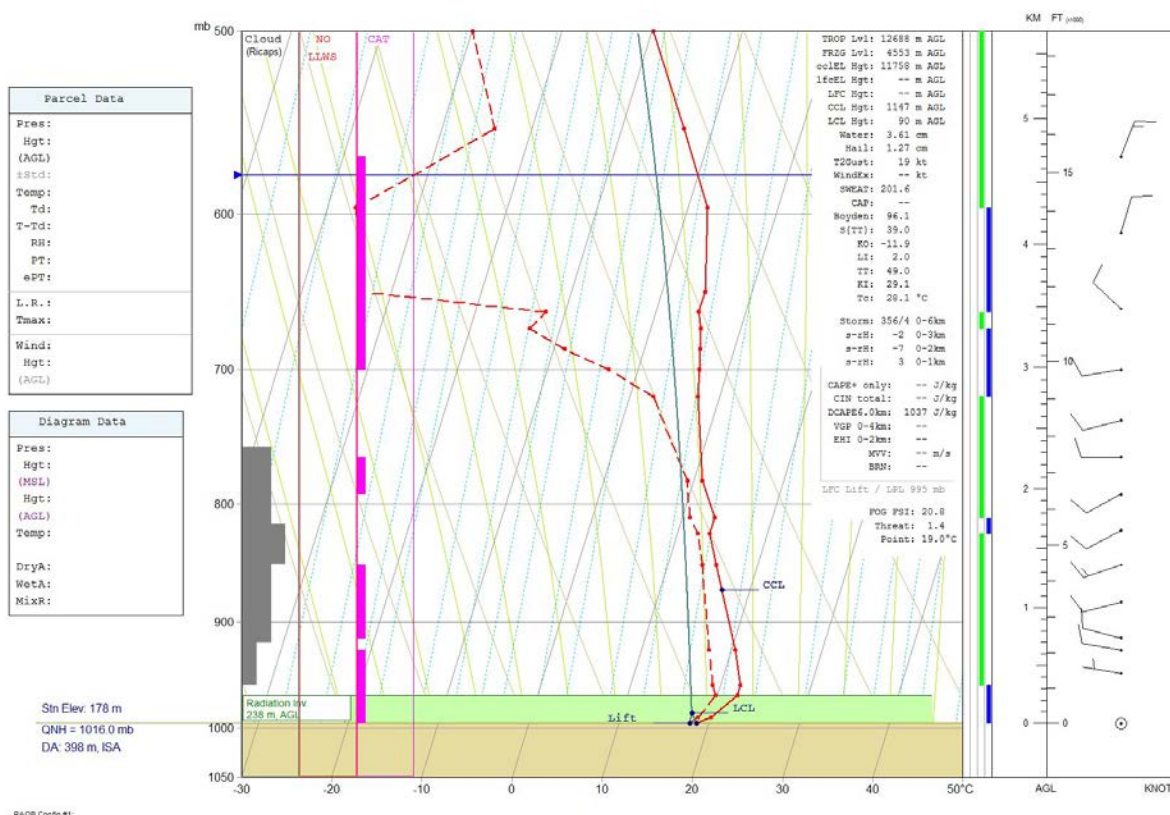


Figure 6 - Lincoln (KILN) 0700 CDT sounding

The sounding indicated a calm surface wind with a temperature of 18.6° C (65.5° F), a dew point temperature of 17.9°C (64.2° F), with a relative humidity of 96%. The lifted condensation level (LCL)⁵ was identified at 296 ft agl, with a convective condensation level (CCL)⁶ at 3,764 ft agl. A surface based temperature inversion was noted to 783 ft, where temperature increased with altitude. The wind profile indicated winds less than 10 knots below 2,000 ft. The freezing level was identified at 15,522 ft and the precipitable water was 1.42 inches.

³ Skew T log P diagram – is a standard meteorological plot or thermodynamic diagram using temperature and the logarithmic of pressure as coordinates, used to display winds, temperature, dew point, and various indices used to define the vertical structure of the atmosphere.

⁴ RAOB – (The complete Rawinsonde Observation program) is an interactive sounding analysis program developed by Environmental Research Services, Matamoras, Pennsylvania.

⁵ Lifting Condensation Level (LCL) - The height at which a parcel of moist air becomes saturated when it is lifted dry adiabatically.

⁶ Convective Condensation Level (CCL) - The height to which a parcel of air, if heated sufficiently from below, will rise adiabatically until condensation starts. This is typically used to identify the base of cumuliform clouds, which are normally produced from surface heating and thermal convection.

The sounding was characterized as stable with a lifted index⁷ of 2.0, and the fog stability index (FSI) was 20.8, the fog threat index of 1.4, and the fog point 19° C, the mean surface to 3,000 ft relative humidity, temperature-dew point spreads, precipitable water value, and wind profile all indicated a moderate to high likelihood for radiation type fog.

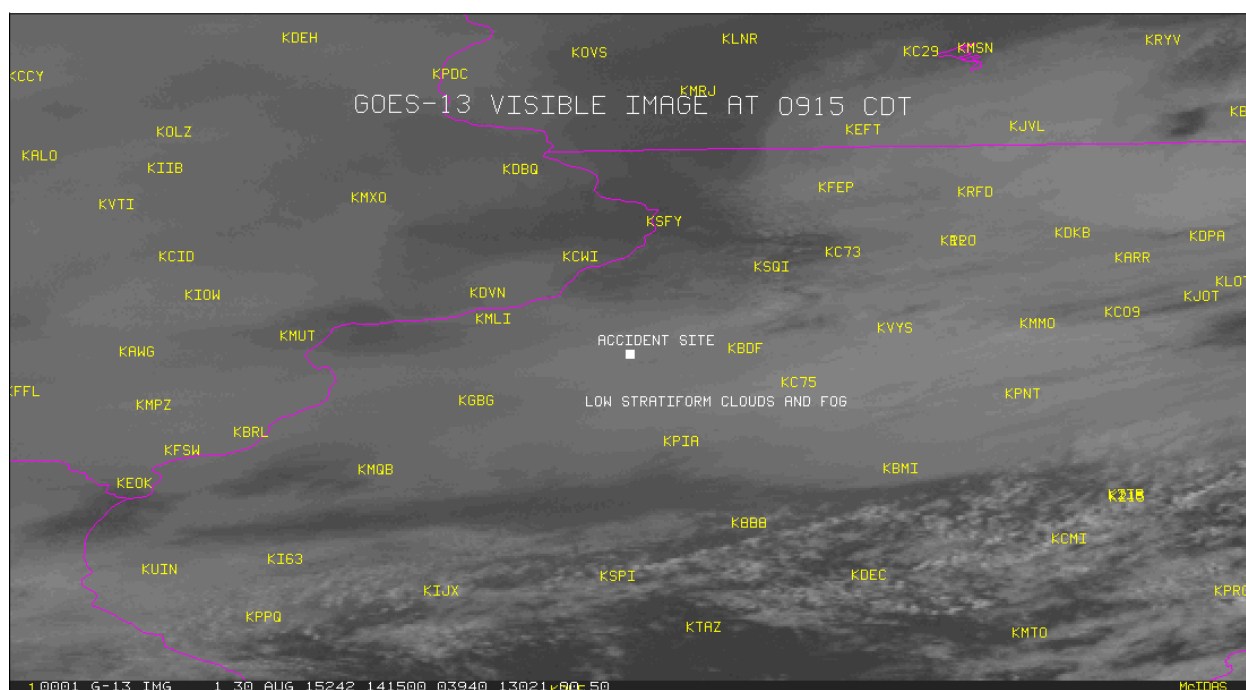
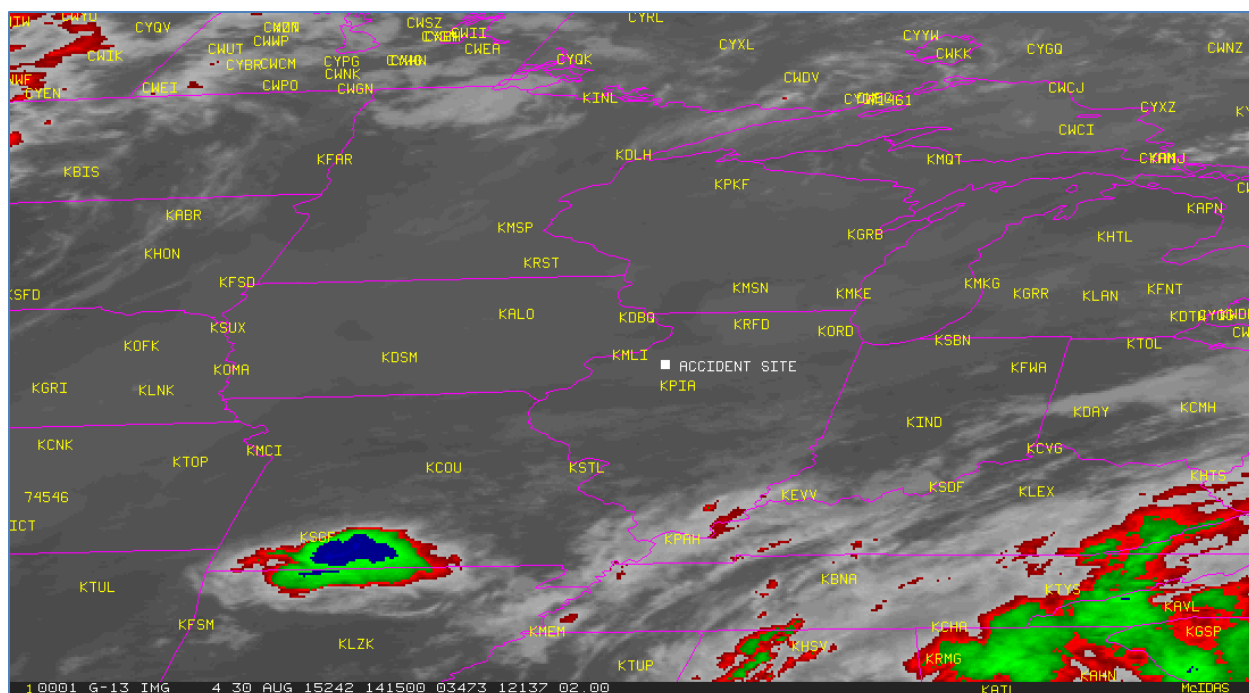
4.0 Satellite Imagery

The Geostationary Operational Environmental Satellite number 13 (GOES-13) data was obtained from an archive at the Space Science Engineering Center at the University of Wisconsin-Madison in Madison, Wisconsin, and processed using the Man-computer Interactive Data Access System software. Both the infrared long wave and visible band imagery were obtained surrounding the time of the accident. The infrared long wave imagery (band 4) at a wavelength of 10.7 microns (μm) provided standard satellite image with radiative cloud top temperatures with a resolution of 4 km. The visible imagery (band 1) at a wavelength of 0.65 μm provided a resolution of 1 km.

Figure 7 is the GOES-13 infrared image at 2X magnification with a standard MB temperature enhancement curve applied to highlight the higher and colder type clouds commonly found with deep convection and heavy rain. The image depicted a large area of cumulonimbus type clouds over southern Missouri and northern Arkansas, with low stratiform type clouds over central and northern Illinois. The radiative cloud top temperature over the accident site was measured at 288° Kelvin or 14.8° C, which corresponded to cloud tops near 4,400 ft based on the KILN sounding.

Figure 8 is the GOES-13 visible image at 2X magnification for the same time of 0915 CDT, and depicts a large area of low stratiform type clouds and fog over Illinois. The image indicated that the accident airplane was in instrument meteorological conditions (IMC) at the time of the accident.

⁷ Lifted Index (LI) - A common measure of atmospheric instability. Its value is obtained by computing the temperature that air near the ground would have if it were lifted to 500-hPa or approximately 18,000 feet and comparing that temperature to the actual temperature at that level. Negative values indicate instability - the more negative, the more unstable the air is, and the stronger the updrafts are likely to be with any developing thunderstorms.



5.0 Weather Radar Imagery

The closest Weather Surveillance Radar-1988, Doppler (WSR-88D) to the accident site was from the NWS KILN WFO location 70 miles southeast of the accident site. The level II archive

data was obtained from the NCEI using the Hierarchical Data Storage System and displayed using the NWS NEXRAD Interactive Viewer and Data Exporter software.

The WSR-88D is a S-band 10 centimeter wavelength radar with a power output of 750,000 watts, with a 28-foot parabolic antenna concentrating the energy into a 0.95° beam width. The radar produces three basic types of products reflectivity, radial velocity, and spectral width.

During the period surrounding the time of the accident the KILN WSR-88D was operating in the clear air mode, or volume coverage pattern (VCP) 32 where the radar makes five elevation scans of the atmosphere with an update rate of about 10 minutes. With the 0.5° elevation scan near 8,000 ft. Figure 8 is the KILN WSR-88D 0.5 base reflectivity image at 0920 CDT and depicted a large area of very light intensity echoes of 0 to 20 dBZ surrounding the radar site with the strongest echoes west of the radar and south of the accident site. Figure 9 is a close up of the accident site at the same time with the flight track overlaid, and indicated no significant echoes overhead the accident site during the period. The light blue area on the image to the northeast of the accident site is a single area of very light echoes or some other false target being detected.

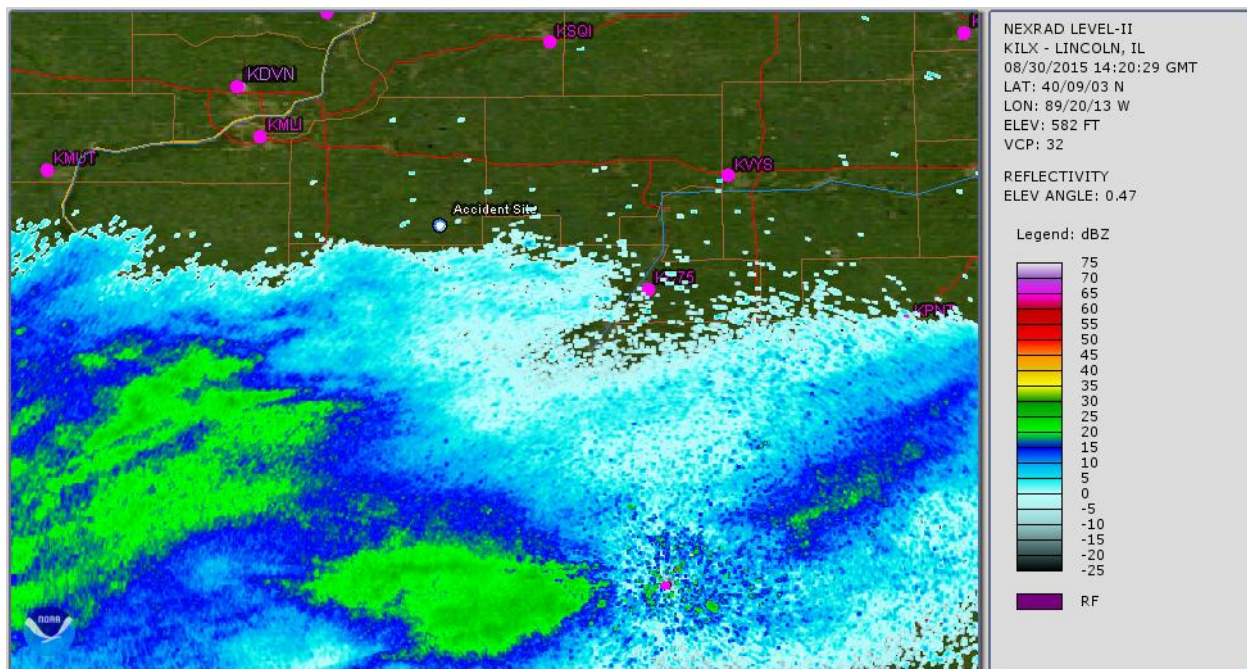


Figure 8 - KILN WSR-88D 0.5° base reflectivity image at 0920 CDT

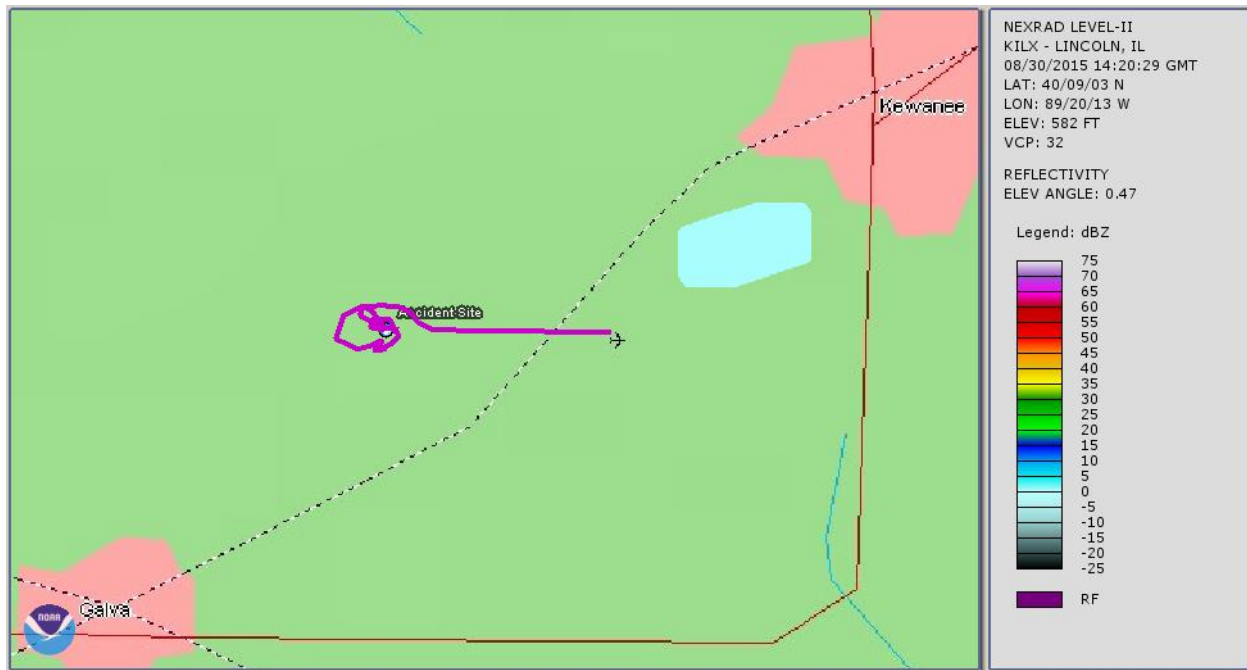


Figure 9 - KILN WSR-88D closeup with the flight track overlaid for 0920 CDT

6.0 Pilot Reports

The following pilot reports or PIREPs were recorded over Illinois surrounding the period from 2 hours prior to and after the accident. The reports are provided in plain language from standard code and abbreviations with time converted to local CDT. The reported were as follows:

Chicago/Rockford International Airport (RFD) routine report (UA); Over – RFD; Time – 0850 CDT; Altitude - 4,000 ft; Type aircraft – Beech Duke (BE60) multiengine piston airplane; Sky cover – overcast at 2,800 ft with tops at 4,000 ft; Weather – flight visibility 8 miles.

Quincy Regional Airport (UIN) routine report (UA); Over – UIN; Time – 0915 CDT; Altitude – 5,000 ft; Type aircraft – Cessna Businessliner (C402) multiengine piston airplane; Sky cover – overcast at 200 ft with tops 1,200 ft, with second overcast layer base at 1,500 ft; Remarks – during climb in instrument meteorological conditions at 5,000 ft; Remarks – entered by Chicago Center.

Peoria International Airport (PIA) routine report (UA); Over – PIA; Time – 0930 CDT; Altitude – unknown; Type aircraft – Embraer (E130) light regional jet; Sky cover – overcast at 200 ft agl.

Quad City International Airport (MLI) routine pilot report (UA); Over - MLI; Time – 1032 CDT; Altitude – 900 ft; Type aircraft – Embraer (E145) light regional jet; Sky cover – overcast bases at 900 ft with tops at 1,500 ft.

University of Illinois-Willard Airport (CMI) routine report (UA); Over – CMI; Time – 1030 CDT; Altitude – unknown; Type aircraft – Learjet (LJ40) corporate jet; Sky cover – broken clouds at 2,500 ft with tops at 9,000 ft reported during climb out.

The raw reports were as follows:

RFD UA /OVC RFD /TM 1350 /FL040 /TP BE60 /SK OVC028-TOP040 /WX FV08SM
UIN UA /OV UIN/TM 1415/FL050/TP C402/SK OVC 002 TOP 012 OVC 015/RM DURC IMC AT 050
ZKCFDC/OH
PIA UA /OV PIA /TM 1430 /FLUNKN /TP E130 /SK OVC002 /RM AGL
MLI UA /OV MLI /TM 1532 /FL 009/TP E145 /SK OVC009-TOP015
CMI UA /OV CMI /TM 1530 /FLUNKN /TP LJ40/SK BKN025-TOP090 DURGC AWC-WEB

7.0 Terminal Forecast

The closest Terminal Aerodrome Forecasts or TAFs were issued by the NWS Quad Cities Weather Forecast Office (WFO) located in Davenport, Iowa for KMLI and the NWS Lincoln, IL WFO for KPIA. With the destination of Hot Springs (KHOT) issued by the NWS Little Rock, AR WFO. While a TAF is only current for a 5 miles radius around the airport center point, it provides a detail breakdown of wind speed and direction, visibility, precipitation type and/or weather phenomena, cloud amount and height (agl) and are often used by pilots to determine conditions forecast for the specific area neighboring the area in question. The forecasts were as follows:

TAF KMLI 301120Z 3012/3112 00000KT 1/4SM FG VV002

FM301500 VRB03KT 3SM BR SKC
FM301600 14004KT P6SM SCT025
FM310900 00000KT 4SM BR SKC=

TAF AMD KMLI 301412Z 3014/3112 07004KT 1/4SM FG VV002

FM301600 09003KT 1 1/2SM BR BKN004
FM301700 10004KT 4SM BR SCT008 BKN022
FM301900 14004KT P6SM SCT025
FM310900 00000KT 4SM BR SKC=

The forecast for KMLI issued at 0620 CDT expected calm winds, with visibility ¼ miles with vertical visibility or ceiling at 200 ft until 1000 CDT, with visibility improving to 3 miles in mist with clearing skies. The forecast was amended at 0912 CDT extending the period of ¼ mile in fog and ceiling of 200 ft until 1100 CDT, with visibility 1 ½ mile in mist with ceiling broken at 400 ft until 1200 CDT, with MVFR to VFR conditions thereafter.

TAF KPIA 301136Z 3012/3112 VRB03KT 2SM BR SCT002 OVC015

TEMPO 3012/3014 1/2SM FG BKN002
FM301400 VRB03KT 4SM BR BKN015
FM301600 VRB05KT P6SM BKN050
FM310100 VRB03KT P6SM SCT250
FM310600 18003KT 4SM BR SCT250=

TAF AMD KPIA 301243Z 3013/3112 VRB03KT 2SM BR SCT002 OVC015

TEMPO 3013/3014 1/4SM FG BKN002
FM301400 VRB03KT 4SM BR BKN015
FM301600 VRB05KT P6SM BKN050
FM310100 VRB03KT P6SM SCT250
FM310600 18003KT 4SM BR SCT250=

TAF AMD KPIA 301331Z 3014/3112 VRB03KT 1/2SM FG SCT002 OVC015

TEMPO 3014/3015 1/4SM FG BKN002
FM301500 VRB03KT 4SM BR BKN015

FM301700 VRB05KT P6SM BKN050
FM310100 VRB03KT P6SM SCT250
FM310600 18003KT 4SM BR SCT250=

TAF AMD KPIA 301416Z 3014/3112 VRB03KT 2SM BR SCT002 OVC015
TEMPO 3014/3015 1/2SM FG BKN002
FM301500 VRB03KT 4SM BR BKN015
FM301700 VRB05KT P6SM BKN050
FM310100 VRB03KT P6SM SCT250
FM310600 18003KT 4SM BR SCT250=

The initial forecast for KPIA was issued at 0636 CDT and expected light and variable winds, visibility 2 miles in mist with scattered clouds at 200 ft and ceiling overcast at 1,500 ft, with temporary conditions between 0700 and 0900 CDT of visibility ½ mile in fog with ceiling broken at 200 ft. Between 0900 and 1100 CDT, light and variable winds, visibility 4 miles in mist, ceiling broken at 1,500 ft. With VFR conditions and clearing after 1100 CDT. The forecast was amended at 0743, 0831, and at 0916 CDT lowering the visibility to ¼ mile in fog with ceiling broken at 200 ft through 0900 and then 1000 CDT, and the latest amendment to ½ mile.

TAF KHOT 301135Z 3012/3112 VRB03KT P6SM SCT100 SCT250
TEMPO 3012/3014 4SM BR
FM301500 20006KT P6SM SCT050 BKN250
FM310100 VRB03KT P6SM SCT250

The forecast for the destination of KHOT issued at 0635 CDT expected a temporary period of mist in the morning with VFR conditions to prevail after 0900 CDT.

8.0 Area Forecast

The Area Forecast (FA) is a forecast of visual flight rules (VFR) clouds and weather conditions over an area as large as the size of several states. It must be used in conjunction with the AIRMET Sierra (IFR) bulletin for the same area in order to get a complete picture of the weather. The area forecast together with the AIRMET Sierra bulletin are used to determine forecast enroute weather and to interpolate conditions at airports which do not have a terminal forecast (TAF) issued. The NWS Aviation Weather Center (AWC) located in Kansas City, Missouri, issues the FA at regular intervals and issues special reports as necessary usually in the form of an AIRMET. The forecasts current at the time of the accident was an amended forecast issued at 0630 CDT and valid until 1700 CDT, the forecast was as follows:

FAUS43 KKCI 301130 AAA
FA3W
-CHIC FA 301130 AMD
SYNOPSIS AND VFR CLDS/WX
SYNOPSIS VALID UNTIL 310400
CLDS/WX VALID UNTIL 302200...OTLK VALID 302200-310400
ND SD NE KS MN IA MO WI LM LS MI LH IL IN KY
.
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...BROAD UPR LVL TROF ERN GREAT LAKES-DEEP S WILL MOV
SLOLY ENEWD THRU OTLK. UPR LVL TROF OZARK BASIN-SRN PLAINS WILL
CONT THRU OTLK. WLY FLOW NW PTN..NLY FLOW N CNTRL PTN..WNW FLOW
NE PTN..NNE FLOW W CNTRL-SW PTN..SW FLOW RMNDR. CDFNT WRN ND
19-22Z WILL APCH CNTRL ND-WRN SD LATE DURG OTLK. TROF W CNTRL
PLAINS THRU PD. TROF ERN OK-CNTRL MO-N CNTRL IL THRU OTLK.

.
IA

BKN015-025 TOPS 030. OCNL VIS 3-5SM BR. BECMG 1417 SCT035-040. OTLK...VFR.

.
MO...UPDT

N HLF...BKN-OVC015-020 TOPS 045. VIS 3-5SM BR. BECMG 1517 BKN035 TOPS 060.

19Z SCT-BKN040 TOPS 080. ISOL -TSRA/-SHRA. CB TOP FL410. OTLK...VFR.

S HLF...SCT050 BKN080 TOPS 140. OCNL VIS 3-5SM BR. ISOL -SHRA/-TSRA. CB TOP FL400.

BECMG 1416 SCT-BKN040-060 BKN100. ISOL -TSRA/-SHRA. CB TOP FL420. OTLK...VFR.

.
WI

BKN-OVC015-020 TOPS 035. VIS 3-5SM BR. BECMG 1416 SCT035. 18Z SKC. OTLK...VFR.

.
LS UPR MI

SCT010-020. OCNL VIS 3-5SM BR. BECMG 1315 SKC. OTLK...VFR.

.
LM LWR MI LH

NRN PTN...BKN-OVC015-025 TOPS 060. OCNL VIS 3-5SM BR. BECMG 1416 SCT035. OTLK...VFR.

SRN PTN...BKN-OVC010-020 TOPS 065. VIS 3-5SM BR. ISOL -SHRA/-TSRA. CB TOP FL360. BECMG

1517 BKN030. ISOL -TSRA/-SHRA. 20Z SCT040. ISOL -TSRA/-SHRA. OTLK...VFR.

.
IL

N HLF...**BKN010-020 TOPS 045. OCNL VIS 3-5SM BR.** BECMG 1517 SCT-BKN040 TOPS 075.

OTLK...VFR.

S HLF...SCT050 BKN080 TOPS 140. ISOL -SHRA/-TSRA. CB TOP FL400. BECMG 1416 SCT-BKN050

BKN080. ISOL -TSRA/-SHRA. OTLK...VFR.

.
IN

BKN040 TOPS 100. ISOL -TSRA/-SHRA. CB TOP FL400. BECMG 1517 BKN050. ISOL -SHRA/-TSRA.

OTLK...VFR.

.
KY

W HLF...SCT-BKN060 TOPS 120 BKN CI. ISOL -TSRA/-SHRA. CB TOP FL410. BECMG 1416 BKN040

BKN100 TOPS 160 BKN CI. ISOL -TSRA/-SHRA. OTLK...VFR.

E HLF...BKN040 BKN080 TOPS 140 BKN CI. OCNL VIS 3-5SM BR. ISOL -SHRA. BECMG 1417 KN050

BKN100 LYRD FL260. ISOL -SHRA/-TSRA. CB TOP FL400. OTLK...VFR.

....

FAUS44 KPCI 301130 AAA

FA4W

-DFWC FA 301130 AMD

SYNOPSIS AND VFR CLDS/WX

SYNOPSIS VALID UNTIL 310400

CLDS/WX VALID UNTIL 302200...OTLK VALID 302200-310400

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...BROAD UPR LVL TROF ERN GREAT LAKES-DEEP S WILL MOV
SLOLY ENEWD THRU OTLK. UPR LVL TROF OZARK BASIN-SRN PLAINS WILL
CONT THRU OTLK. WLY FLOW NW PTN..NLY FLOW N CNTRL PTN..WNW FLOW
NE PTN..NNE FLOW W CNTRL-SW PTN..SW FLOW RMNDR. CDFNT WRN ND
19-22Z WILL APCH CNTRL ND-WRN SD LATE DURG OTLK. TROF W CNTRL
PLAINS THRU PD. TROF ERN OK-CNTRL MO-N CNTRL IL THRU OTLK.

AR...UPDT

SCT080-100 SCT CI. OCNL VIS 3-5SM BR. ISOL -SHRA/-TSRA. CB TOP FL410. 14Z SCT060-080
SCT100. ISOL -SHRA/-TSRA. BECMG 1618 SCT050 SCT100. ISOL -TSRA/-SHRA. CB TOP FL400.
OTLK...VFR.

The header in the forecast warned user to see AIRMET Sierra for IFR conditions. The forecast for northern Illinois expected broken clouds at 1,000 to 2,000 ft with tops near 4,500 ft, with occasional visibility of 3 to 5 miles in mist. The low ceilings and visibility was expected to begin to improve between 1000 and 1200 CDT, with VFR conditions for the afternoon. The forecast was amended by AIRMET Sierra below.

9.0 Inflight Weather Advisories

Inflight Aviation Weather Advisories are forecasts to advise en route aircraft of development of potentially hazardous weather. Inflight aviation weather advisories in the conterminous U.S. are issued by the NWS Aviation Weather Center (AWC), as well as from the Center Weather Service Units (CWSU) associated with FAA Air Route Traffic Control Center's (ARTCCs).

There are four basic types of inflight aviation weather advisories: the Significant Meteorological Advisory (SIGMET), the Convective SIGMET, the Airmen's Meteorological Information (AIRMET), and the Center Weather Advisory (CWA). All of these advisories use the same location identifiers (either VORs, airports, or well-known geographic areas) to describe the hazardous weather areas. The Severe Weather Watch Bulletins (WWs), with the associated Alert Messages (AWW) supplements these advisories.

During the period leading to the time of the accident, the NWS AWC issued two advisories, a Convective SIGMET for an area of thunderstorms over southern Missouri and northern Arkansas and AIRMET Sierra for IFR conditions extending over Illinois and the surrounding area. The text of the advisories and a graphic plot of the areas are included below as figures 10 and 11.

WSUS32 KKC1 301355
SIGC
-MKCC WST 301355
CONVECTIVE SIGMET 9C
VALID UNTIL 1555Z
MO AR
FROM 50E SGF-80W ARG-30ESE RZC-20SW SGF-50E SGF
AREA TS MOV FROM 25010KT. TOPS ABV FL450.
OUTLOOK VALID 301555-301955
FROM 30S BVT-40N MSL-LIT-MLC-30NNE OSW-40SW COU-UIN-30S BVT

WST ISSUANCES POSS. REFER TO MOST RECENT ACUS01 KWNS FROM STORM PREDICTION CENTER FOR SYNOPSIS AND METEOROLOGICAL DETAILS.

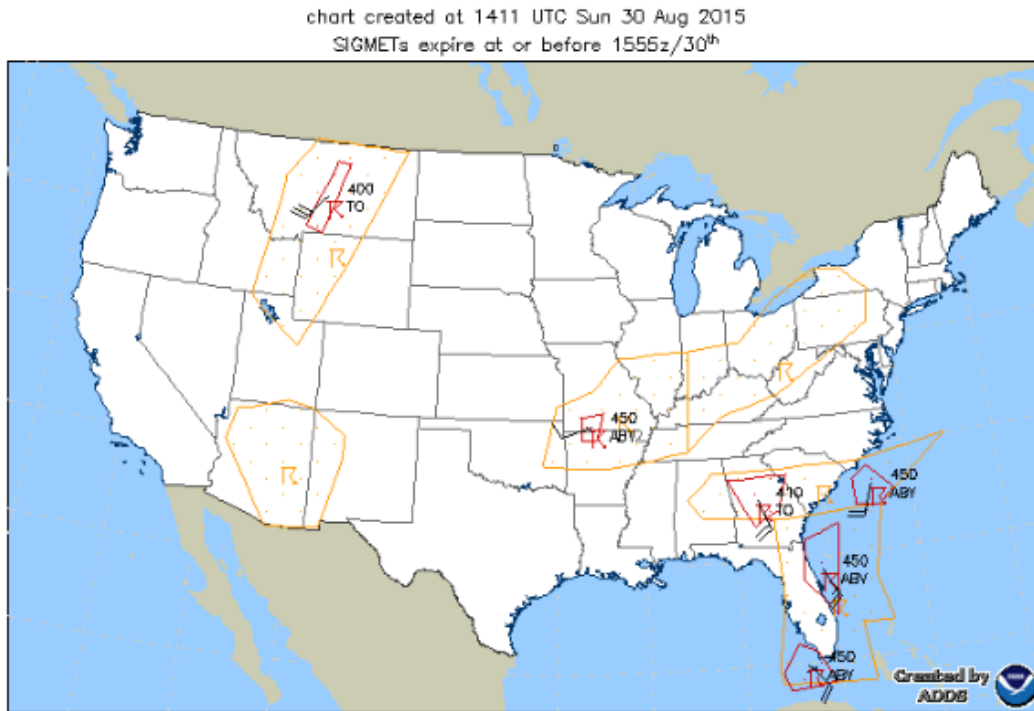


Figure 10 - Convective SIGMET current at the time of the accident

WAUS43 KPCI 300845

WA3S

-CHIS WA 300845

AIRMET SIERRA UPDT 2 FOR IFR VALID UNTIL 301500

.
AIRMET IFR...ND SD NE KS MN IA MO WI LS MI IL
FROM 70NW INL TO YQT TO 60ESE DLH TO 40ESE COU TO 20NNE OSW TO
40N MMB TO 40NNW LBF TO 20E GFK TO 70NW INL
CIG BLW 010/VIS BLW 3SM BR/FG. CONDS CONTG BYD 15Z ENDG 15-18Z.

.
AIRMET IFR...IA MO WI LM LS MI LH IL IN
FROM YQT TO SSM TO YVV TO 40SSE ECK TO FWA TO CVG TO 40ESE COU
TO 60ESE DLH TO YQT
CIG BLW 010/VIS BLW 3SM BR/FG. CONDS CONTG BYD 15Z ENDG 15-18Z.

....

SIERRA 2015-08-30 12:00:00

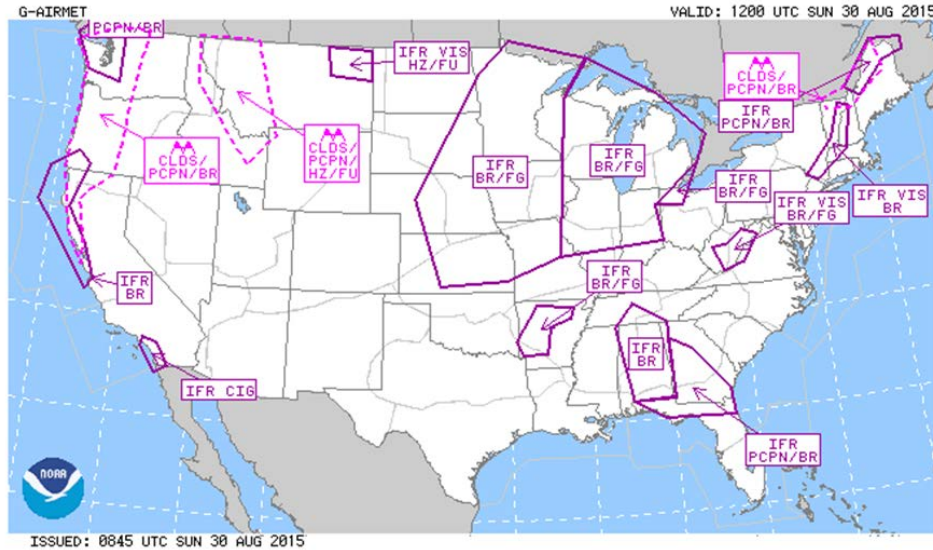


Figure 11 - Plot of AIRMET Sierra for IFR conditions

A review of the Chicago (KZAU) Air Route Traffic Control (ARTCC) Center's Center Weather Service Unit (CWSU) indicated that no Center Weather Advisories or Meteorological Impact Statements were issued for the area surrounding the period related to the accident.

10.0 Winds and Temperature Aloft Forecast

The following winds and temperature aloft forecast was valid for the period of the flight for the route between Kewanee and Hot Springs. The forecast for the first level at 3,000 ft was for light and variable winds less than 10 knots. The forecast for the route of flight was as follows:

WINDS ALOFT FORECASTS

DATA BASED ON 301200Z

VALID 301800Z FOR USE 1400-2100Z. TEMPS NEG ABV 24000

FT	3000	6000	9000	12000	18000	24000	30000	34000	39000
BRL	9900	9900+17	0518+11	0413+06	0214-09	0212-21	043037	043347	032656
DBQ	9900	3605+18	0109+11	0109+05	0215-09	0317-19	032736	022747	023057
SPI	9900	2309+14	9900+10	0407+06	0214-08	0108-21	010937	021147	020656
JOT	9900	9900+16	0205+11	3610+07	0112-08	0114-21	032637	032847	011556
STL	9900	2208+15	2609+09	9900+06	0415-08	0312-20	021038	021448	990056
COU	1207	1807+15	2206+10	0905+07	0517-08	0313-21	021638	022247	031956
SGF	2106	2116+16	2113+10	2307+04	0714-08	0616-21	041937	022447	021957
LIT	1807	1809+16	1306+10	9900+04	9900-09	9900-21	261136	262746	232755
FSM	1610	1915+17	2012+11	2310+04	0308-08	0420-21	032337	021847	360856

11.0 Astronomical Conditions

The United States Naval Observatory website provided the following astronomical data for Kewanee, Henry County, IL on August 30, 2015.

SUN

Beginning civil twilight	0555 CDT
Sunrise	0624 CDT
Sun transit	1300 CDT
Sunset	1936 CDT
End civil twilight	2004 CDT

At the approximate time of the accident the sun was located at an elevation of 32° above the horizon at an azimuth of 106°, which was likely obscured by the low stratiform clouds and fog at the time of the accident.

Submitted by:

Don Eick
Senior Meteorologist

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