National Transportation Safety Board

Office of Aviation Safety
Washington, D.C. 20594-2000
February 13, 2015
WEATHER STUDY
HWY15MH004

A. Accident

Location: Penwell, Texas
Date: January 14, 2015
Time: about 0750 central standard time (1350 UTC[1])
Vehicle: 2015 Bluebird prisoner transport bus

B. Meteorological Specialist

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

C. Details of the Investigation

The National Transportation Safety Board's meteorological specialist was not on scene and gathered weather data for this investigation from the Washington D.C. office from official National Oceanic and Atmospheric Administration (NOAA)'s National Weather Service (NWS), the National Climatic Data Center (NCDC) and other sources. All times are for January 14, 2015, unless otherwise noted, and are based upon the 24-hour clock. Directions are referenced to true north and distances in nautical miles unless otherwise indicated. Distances along the surface of the earth are calculated using the "Great Circle" formula.

Coordinates used for the accident location: 31.751389° North latitude, -102.559444° West longitude.

[1] UTC – abbreviation for Coordinated Universal Time

Surface Observations

An Automated Surface Observing System (ASOS) at Odessa Airport-Schlemeyer Field (KODO) in Odessa, Texas, was located about 13 miles to the northeast of the accident site at an elevation of 3,004 feet. The following automated reports were issued from KODO during the time period leading up to, and following, the accident time:

[0404 CST] SPECI KODO 141004Z AUTO 07008KT 3SM BR OVC003 M01/M02 A3029 RMK AO2 T10061017=

[0453 CST] METAR KODO 141053Z AUTO 07007KT 3SM BR OVC004 M01/M02 A3028 RMK AO2 SLP258 T10061017=

[0515 CST] SPECI KODO 141115Z AUTO 06007KT 2 1/2SM BR OVC004 M01/M02 A3028 RMK AO2 T10061022=

[0553 CST] METAR KODO 141153Z AUTO 06007KT 2SM BR OVC004 M01/M02 A3028 RMK AO2 SLP260 I1001 I6002 T10111022 11006 21011 56005=

[0627 CST] SPECI KODO 141227Z AUTO 06007KT 3SM BR OVC004 M01/M02 A3028 RMK AO2 I1000 T10111022=

[0653 CST] METAR KODO 141253Z AUTO 06006KT 3SM BR BKN005 OVC016 M01/M02 A3029 RMK AO2 SLP265 I1001 T10111022=

[0701 CST] SPECI KODO 141301Z AUTO 06006KT 2 1/2SM BR BKN005 OVC016 M01/M02 A3029 RMK AO2 T10111022=

[0614 CST] SPECI KODO 141314Z AUTO 06007KT 2 1/2SM BR BKN004 OVC015 M01/M02 A3030 RMK AO2 T10111022=

[0653 CST] METAR KODO 141353Z AUTO 07007KT 2 1/2SM BR OVC004 M01/M02 A3030 RMK AO2 CIG 003V007 SLP268 I1000 T10111022=

[0800 CST] SPECI KODO 141400Z AUTO 07007KT 3SM BR OVC006 M01/M02 A3030 RMK AO2 T10111022=

[0810 CST] SPECI KODO 141410Z AUTO 07005KT 2SM BR OVC005 M01/M02 A3030 RMK AO2 I1000 T10111022=

[0814 CST] SPECI KODO 141414Z AUTO 07005KT 1 3/4SM BR BKN003 OVC007 M01/M02 A3030 RMK AO2 I1000 T10061022=

At 0800 CST, the automated report from KODO included a visibility of three statute miles, mist, a temperature of -1.1º Celsius (C) and a dew point temperature of -2.2°C.

An ASOS at Midland International Airport (KMAF) in Midland, Texas, was located about 22 miles to the northeast-east of the accident site at an elevation of about 2,872 feet. The following automated and observer-augmented reports were issued from KMAF during the time period leading up to and following the accident time:

[0433 CST] SPECI KMAF 141033Z AUTO 06006KT 2 1/2SM BR OVC005 M01/M02 A3028 RMK AO2 I1001 T10061017 TSNO=

[0453 CST] METAR KMAF 141053Z AUTO 05006KT 2 1/2SM BR OVC005 M01/M02 A3028 RMK AO2 SLP259 I1001 T10061017 TSNO=

[0505 CST] SPECI KMAF 141105Z AUTO 05006KT 2 1/2SM BR OVC004 M01/M02 A3028 RMK AO2 T10061017 TSNO=

[0553 CST] METAR KMAF 141153Z AUTO 04007KT 2SM BR OVC004 M01/M02 A3028 RMK AO2 SLP258 I1001 I6002 T10061017 10000 21006 58005 TSNO=

[0618 CST] SPECI KMAF 141218Z 05006KT 3SM BR BKN004 OVC018 M01/M02 A3028 RMK AO2 I1000 T10061017=

[0653 CST] METAR KMAF 141253Z 06006KT 2 1/2SM BR OVC004 M01/M02 A3029 RMK AO2 SLP263 I1001 T10061017=

[0753 CST] METAR KMAF 141353Z 05004KT 2 1/2SM BR OVC004 M01/M02 A3030 RMK AO2 SLP264 I1001 T10061017=

[0820 CST] SPECI KMAF 141420Z 07005KT 1 3/4SM BR OVC004 M01/M02 A3030 RMK AO2 I1000 T10061017=

At 0753 CST, the observer-augmented report from KMAF included a visibility of two-and-a-half statute miles, mist, a temperature of -0.6ºC and a dew point temperature of -1.7°C.

An ASOS at Winkler County Airport (KINK) in Wink, Texas, was located about 33 miles to the west of the accident site at an elevation of about 2,822 feet. The following automated reports were issued from KINK during the time period leading up to and following the accident time:

[0453 CST] METAR KINK 141053Z AUTO 07003KT 5SM BR OVC007 00/M02 A3027 RMK AO2 SLP258 T00001017=

[0553 CST] METAR KINK 141153Z AUTO 08004KT 5SM BR OVC009 01/M02 A3027 RMK AO2 SLP255 I6002 T00061017 10006 21006 58005=

[0625 CST] SPECI KINK 141225Z AUTO 09003KT 6SM BR OVC010 01/M02 A3028 RMK AO2 T00061017=

[0653 CST] METAR KINK 141253Z AUTO 07003KT 6SM BR OVC011 01/M02 A3028 RMK AO2 SLP259 T00061017=

[0728 CST] SPECI KINK 141328Z AUTO 08003KT 6SM BR BKN008 OVC012 01/M02 A3029 RMK AO2 CIG 006V011 T00061017=

[0753 CST] METAR KINK 141353Z AUTO 08003KT 6SM BR OVC007 01/M02 A3029=

[0853 CST] METAR KINK 141453Z AUTO 06003KT 5SM BR OVC009 01/M02 A3030 RMK AO2 CIG 006V011 SLP269 I1001 I3001 T00061017 51010=

At 0753 CST, the automated report from KINK included a visibility of six statute miles, mist, a temperature of 1ºC and a dew point temperature of -2°C.

Unofficial weather observations were retrieved from the Union Pacific Railroad weather station UR203,[2] which was located about 10 miles to the southwest-west of the accident site at an elevation of approximately 2,841 feet. Data from this station is presented below with time in CST and temperature in degrees Fahrenheit (F). This station's maintenance, siting and data quality are unknown.

Time	Temp(°F)
0340	31
0540	31
0550	30
0735	31
0825	31
0940	31

Weather Radar

WSR-88D Level-II 0.51° tilt base reflectivity data from Midland/Odessa, Texas, are presented in figure 1. The weather radar was located approximately 22 miles to the northeast-east of the accident site. Assuming standard refraction, the weather radar's 0.51° tilt would have "seen" altitudes between about 200 and 2,400 feet above the accident site ground level. The imagery identified very light values of reflectivity in the immediate region. A review of earlier Midland/Odessa weather radar imagery identified a very similar reflectivity pattern in the hours leading up to the accident time.

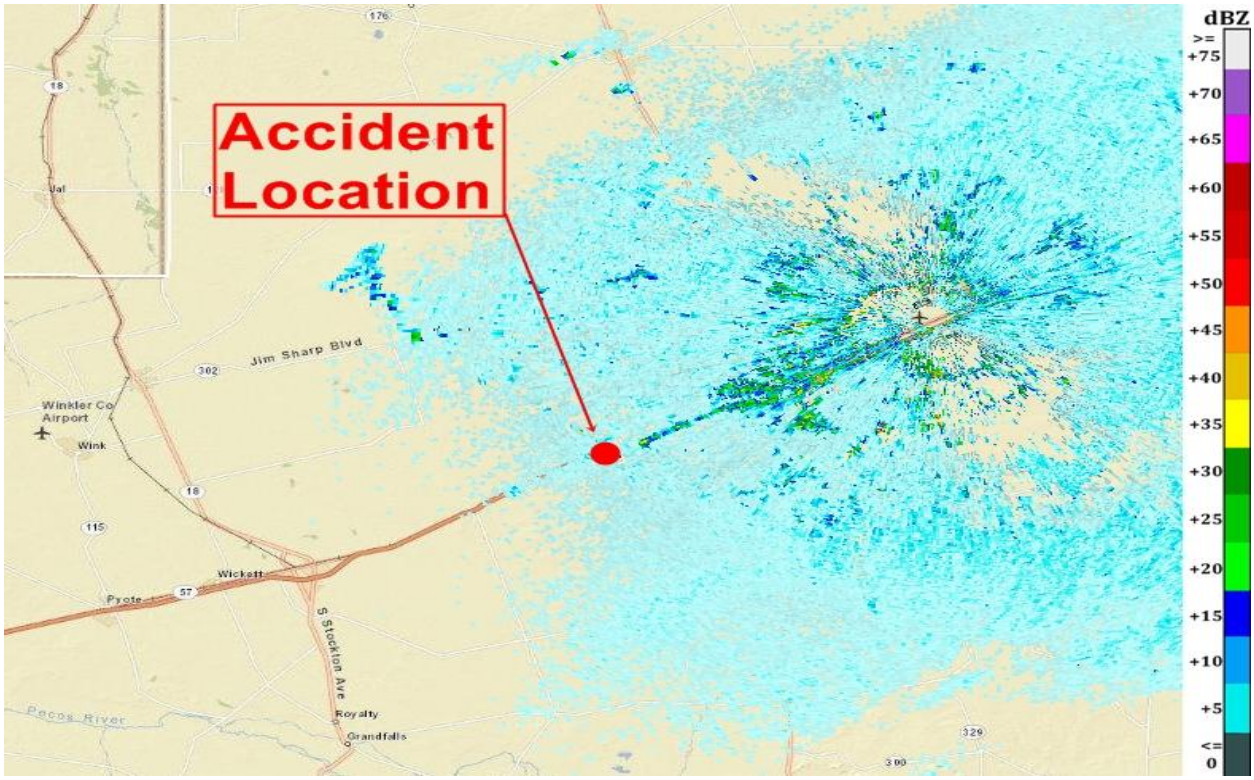

Figure 1 – WSR-88D Level-II 0.51° tilt base reflectivity data for 0750 CST from Midland/ Odessa, Texas.

[2] Courtesy of MesoWest

National Weather Service Products

An Area Forecast Discussion (AFD) was issued at 0522 CST by the NWS Weather Forecast Office in Midland/Odessa, Texas (KMAF). The "previous discussion" section has been omitted for this report.

FXUS64 KMAF 141122
AFDMAF
AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE MIDLAND/ODESSA TX
522 AM CST Wed Jan 14 2015

.AVIATION...
12Z TAF issuance...
The main aviation concern for the next 24 hours is low cigs/vis affecting terminals through much of the morning. Generally have LIFR or IFR conditions across the board this morning with light ENE winds in place. Most locations reporting vis above 2SM overnight except for FST where it has reported vis as low as 1/2-3/4SM at times. Temperatures have remained much warmer than previously expected therefore think chances for FZFG is fairly low. Cigs and vis will continue to bounce around throughout the morning hours but expect conditions to improve to MVFR by late morning/early afternoon then to VFR later this evening.

Prior to the 0522 CST AFD, an AFD was issued at 0357 CST by KMAF. This AFD notes the presence of light freezing fog and freezing drizzle across the area.

FXUS64 KMAF 140957
AFDMAF
AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE MIDLAND/ODESSA TX
357 AM CST Wed Jan 14 2015

.DISCUSSION...
Once again we are seeing light freezing fog and freezing drizzle across the area. However temperatures are slightly warmer (though still just below freezing) than yesterday so hopefully road conditions will be a little better. An upper level low over Arizona will move eastward into Texas tonight. Models are showing this feature weakening and becoming very positively tilted as it enters into New Mexico today. This will keep precipitation chances low and mainly focused on areas west of the Pecos River where orographic lift is greatest. Forecast soundings indicate snow or sleet would be most likely, though rain is possible if surface temperatures manage to warm into the upper 30s.
The upper pattern becomes more zonal after the passage of this trough allowing for clearing skies and warmer temperatures into early next week. A trough moving into the Central Plains will send another front south into west Texas on Saturday though with little amplification of the upper pattern, do not expect any cold air with near normal to slightly above normal temperatures expected.

A Special Weather Statement was issued at 2209 CST on January 13, 2015, by KMAF. This statement discussed the nighttime light roadway icing hazard potential.

WWUS84 KMAF 140409 AAA
SPSMAF
SPECIAL WEATHER STATEMENT...UPDATED
NATIONAL WEATHER SERVICE MIDLAND/ODESSA TX
1009 PM CST TUE JAN 13 2015
NMZ027>029-033-034-TXZ045>048-050>053-057>063-067>070-074-075-079>082-258-141200-
GUADALUPE MOUNTAINS OF EDDY COUNTY-EDDY COUNTY PLAINS-NORTHERN LEA COUNTY-CENTRAL LEA COUNTY-SOUTHERN LEA COUNTY-GAINES- DAWSON – BORDEN – SCURRY – ANDREWS – MARTIN -HOWARD-MITCHELL-VAN HORN AND HIGHWAY 54 CORRIDOR-REEVES COUNTY AND UPPER TRANS PECOS-LOVING-WINKLER-ECTOR-MIDLAND- GLASSCOCK-WARD-CRANE-UPTON-REAGAN-DAVIS/APACHE MOUNTAINS AREA- PECOS-PRESIDIO VALLEY-MARFA PLATEAU-BIG BEND AREA-TERRELL-GUADALUPE MOUNTAINS-
INCLUDING THE CITIES OF...QUEEN...ARTESIA...CARLSBAD... CARLSBAD CAVERNS NP ... TATUM ... HOBBS ... LOVINGTON ... EUNICE ... JAL ... SEMINOLE ... LAMESA ... GAIL ... SNYDER ... ANDREWS ... STANTON ... BIG SPRING...COLORADO CITY...VAN HORN...PECOS...MENTONE...RED BLUFF LAKE ... KERMIT ... ODESSA ... MIDLAND ... GARDEN CITY ... MONAHANS ...CRANE...MCCAMEY...RANKIN...BIG LAKE...ALPINE...FORT DAVIS...FORT STOCKTON ... PRESIDIO ... MARFA ... BIG BEND NP... MARATHON ... SANDERSON ...GUADALUPE MOUNTAINS NP...PINE SPRINGS
1009 PM CST TUE JAN 13 2015 /909 PM MST TUE JAN 13 2015/

...LIGHT FREEZING DRIZZLE AND FREEZING FOG POSSIBLE TONIGHT... LATE EVENING TEMPERATURES ARE MOSTLY IN THE 30-32 DEGREE RANGE AND ARE EXPECTED TO FALL A FEW MORE DEGREES OVERNIGHT. MANY AREAS OF SOUTHEAST NEW MEXICO AND THE BASIN ARE REPORTING FOG WITH THE VISIBILITY BETWEEN 2 AND 4 MILES. MEANWHILE ON THE EAST SLOPES OF THE MOUNTAINS LOCAL VISIBILITY COULD BE ONE QUARTER MILE OR LESS. AREAS OF FREEZING DRIZZLE MAY ACCOMPANY THE FREEZING FOG AND INCREASE THE POTENTIAL FOR LIGHT ICING OVERNIGHT RESULTING IN
SLICK ROADS...ESPECIALLY BRIDGES AND OVERPASSES...STAIRWAYS AND EVEN SIDEWALKS...NOT TO MENTION DIFFICULT DRIVING DUE TO LOW VISIBILITIES. LIGHT ICE ACCUMULATIONS HAVE PROVEN TO BE VERY PROBLEMATIC RECENTLY FOR TRAVEL...AND IT IS ADVISED TO DRIVE CAUTIOUSLY AND ALLOW EXTRA TIME TO REACH YOUR DESTINATION.

A Special Weather Statement was issued at 0318 CST on January 14, 2015, by KMAF. This statement discussed potential for freezing fog, freezing drizzle and potentially hazardous driving conditions.

FLUS44 KMAF 140918
HWOMAF

HAZARDOUS WEATHER OUTLOOK
NATIONAL WEATHER SERVICE MIDLAND/ODESSA TX
318 AM CST WED JAN 14 2015
NMZ027>029-033-034-TXZ045>048-050>053-057>063-067>070-074-075-079>082-258-150930-
GUADALUPE MOUNTAINS OF EDDY COUNTY-EDDY COUNTY PLAINS-NORTHERN LEA COUNTY-CENTRAL LEA COUNTY-SOUTHERN LEA COUNTY-GAINES- DAWSON – BORDEN – SCURRY – ANDREWS – MARTIN - HOWARD-MITCHELL-VAN HORN AND HIGHWAY 54 CORRIDOR-REEVES COUNTY AND UPPER TRANS PECOS-LOVING-WINKLER-ECTOR-MIDLAND-GLASSCOCK-WARD-CRANE-UPTON-REAGAN-DAVIS/APACHE MOUNTAINS AREA-PECOS-PRESIDIO VALLEY-MARFA PLATEAU- BIG BEND AREA – TERRELL - GUADALUPE MOUNTAINS-
318 AM CST WED JAN 14 2015 /218 AM MST WED JAN 14 2015/

THIS HAZARDOUS WEATHER OUTLOOK IS FOR PORTIONS OF SOUTHEAST NEW MEXICO...SOUTHWEST TEXAS AND WEST TEXAS.
.DAY ONE...TODAY AND TONIGHT
PATCHY LIGHT FREEZING DRIZZLE AND FREEZING FOG EXPECTED TO CONTINUE THIS MORNING ACROSS MOST AREAS WITH SOME LIGHT SLEET OR SNOW POSSIBLE FOR PORTIONS OF SOUTHEAST NEW MEXICO THROUGH THIS AFTERNOON. VERY LIGHT ICE ACCUMULATIONS ARE POSSIBLE THAT COULD RESULT IN HAZARDOUS DRIVING CONDITIONS.
.DAYS TWO THROUGH SEVEN...THURSDAY THROUGH TUESDAY
THE PROBABILITY FOR WIDESPREAD HAZARDOUS WEATHER IS LOW.
.SPOTTER INFORMATION STATEMENT...
SPOTTER ACTIVATION IS NOT ANTICIPATED.

Astronomical Data

The astronomical data obtained from the United States Naval Observatory for 31° 45' north latitude and 102° 34' west longitude, indicated the following:

SUN

Begin Civil Twilight	0724 CST
Sunrise	0751 CST

MOON

Moonrise	0156 CST
Moon transit	0738 CST
Moonset	1316 CST

Submitted by: Mike Richards
NTSB, AS-30