



MEMORANDUM FOR RECORD

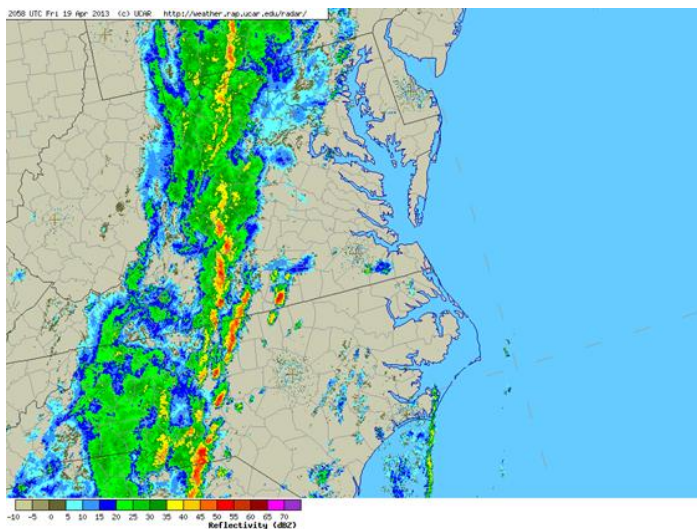
Jay Neylon
Air Safety Investigator
Eastern Region Aviation

Date: April 22, 2013
NTSB Accident Number: ERA13FA209
Weather Report: Don Eick, NTSB Senior Meteorologist

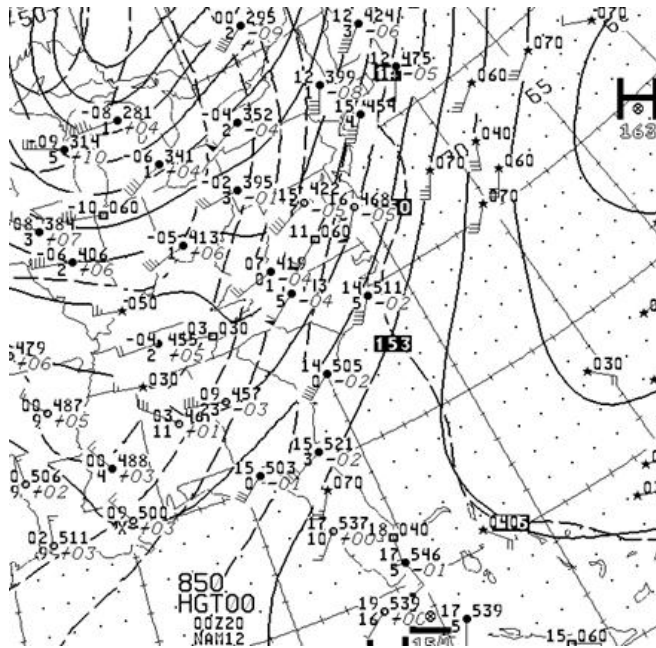
Weather condition on April 19, 2013 in the vicinity of Williamsburg-Jamestown Airport

Synoptic conditions – the NWS Surface Analysis Chart for 1700 EDT (2100Z) on April 19, 2013 depicted a low pressure system at 1007-hectopascals along a frontal wave over North Carolina with the cold front extending northward into Virginia to the west of the accident site. An outflow boundary was depicted ahead of the low extending into central Virginia, North Carolina, South Carolina, into Georgia. The station models depicted strong southerly winds of 15 to 20 knots ahead of the front.

The NWS regional radar mosaic for 1658 EDT (2058Z) depicted a broken line of thunderstorms and rain showers along and ahead of the approaching frontal system to the west, a small area of echoes was identified south of the area.



The NWS 850-hPa constant pressure chart for 2000 EDT (0000Z April 20, 2013) depicted the conditions at 5,000 feet and depicted a band of 50 knot winds from the south over the area associated with a strong pressure gradient.



Observations –Williamsburg-Jamestown Airport (KJGG) at an elevation of 49 feet and a magnetic variation of 11 W, had an Automated Weather Observation System (AWOS) and reported the following conditions at the approximate time of the accident:

Williamsburg-Jamestown Airport weather at 1655 EDT (2055Z), automated, wind from 180° true at 14 knots gusting to 28 knots, visibility unrestricted at 10 statute miles, weather missing, sky clear below 12,000 feet, temperature 28° Celsius (C), dew point 19° C, altimeter 29.75 inches of mercury (Hg). Remarks: automated observation system without a precipitation discriminator.

The raw observations surrounding the period were as follows:

METAR KJGG 191955Z AUTO 20014G19KT 10SM SCT050 SCT065 29/18 A2977 RMK AO1=
 METAR KJGG 192015Z AUTO 19014G18KT 160V220 10SM SCT060 29/18 A2976 RMK AO1=
 METAR KJGG 192035Z AUTO 19020G26KT 10SM SCT060 28/18 A2975 RMK AO1=
 METAR KJGG 192055Z AUTO 18014G28KT 10SM CLR 28/19 A2975 RMK AO1=
 Accident 2056Z
 METAR KJGG 192115Z AUTO 19018G25KT 10SM SCT044 BKN050 28/19 A2975 RMK AO1=
 METAR KJGG 192135Z AUTO 19016G28KT 10SM SCT043 BKN050 27/19 A2975 RMK AO1=
 METAR KJGG 192155Z AUTO 19018G24KT 10SM SCT041 27/19 A2974 RMK AO1=
 METAR KJGG 192215Z AUTO 19014G20KT 10SM CLR 26/19 A2974 RMK AO1=
 METAR KJGG 192235Z AUTO 20015G23KT 10SM CLR 26/19 A2973 RMK AO1=

Terminal Aerodrome Forecast (TAF) – destination airport did not have a TAF issued for it, closest was for Fort Eustis/Felker (KFAF)

TAF KFAF 1918/2024 19015G20KT 9999 SCT050 530305 QNH2982INS
BECMG 1921/1922 20015G25KT 9999 OVC020 540305 QNH2976INS
BECMG 2001/2002 20015G25KT 8000 -SHRA OVC020 540305 QNH2974INS
TEMPO 2003/2007 24025G30KT 3200 -TSRA BKN007CB
BECMG 2006/2007 31015G20KT 4800 -SHRA BKN015 OVC030 QNH2986INS
BECMG 2010/2011 30010G15KT 9999 NSW SCT030 BKN100 QNH3004INS
T29/1920Z T11/2010Z=

Sounding – the Wallops Island (KWAL) sounding for 2000 EDT (0000Z on April 20, 2013) depicted a low-level temperature inversion at 793 feet agl and another one due to subsidence at 3,621 feet. The freezing level was identified above 13,000 feet. The wind profile of the sounding indicated a surface wind was from 210° at 23 knots with winds increasing in speed with little direction variation through 18,000 feet. A low-level jet stream was identified at 4,000 feet with wind from 215° at 54 knots, with winds above 50 knots at 1,000 feet msl. The mean 0 to 6 kilometer or 18,000 foot wind was from 216° at 54 knots. The sounding indicated a potential low-level wind shear below 1,000 feet due to strong vertical wind shears. Sounding attached.

Satellite – the GOES-13 visible image at 2X magnification for 1645 EDT (2045Z) is attached. The image depicts a small area of cumulus congestus clouds immediately south associated with an area of rain showers moving northward. Multiple higher clouds are reported across the area, differs from AWOS clear report.

NWS WSR-88D – the Wakefield, VA WSR-88D was examined and the 1656 EDT image is attached. It depicted a growing area of weather south with strong to severe thunderstorms to the west moving north-northeast. No significant echoes were identified in the immediate vicinity of the accident site.

Area Forecast (FA) – current during the period was as follows:

FAUS41 KKCI 191840 AAA 2013109 1840
FA1W
-BOSC FA 191840 AMD
SYNOPSIS AND VFR CLDS/WX
SYNOPSIS VALID UNTIL 201200
CLDS/WX VALID UNTIL 200600...OTLK VALID 200600-201200
ME NH VT MA RI CT NY LO NJ PA OH LE WV MD DC DE VA AND CSTL WTRS
.
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...AT 18Z CDFNT FROM OH/PA BORDER SWD TO WRN VA. CDFNT
MOVG EWD AND BY END OF FCST PD EXTDG FROM FAR NRN ME-LONG
ISLAND-LOW PRES SERN VA. BY END OF OTLK PD CDFNT EXTDG FROM ME
CSTL WTRS TO VA CSTL WTRS.
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MD DC DE VA...UPDT
MTNS...BKN045 LYRD FL250. WDLY SCT -SHRA. 20Z WDLY SCT -TSRA. CB
TOP FL410. WND S G25KT. 02Z BKN055 TOP 120. WND W G25KT. OTLK...VFR.
PIEDMONT...BKN025 LYRD FL250. 20Z SCT -TSRA. CB TOP FL430. TS POSS SEV. 01Z WND NW G25KT. 04Z
BKN050 TOP 100. OTLK...VFR.
CSTL PLAINS...SCT030 BKN050 TOP 100. ISOL -SHRA. BECMG 2103 BKN025 LYRD FL250. SCT -TSRA. CB
TOP FL450.
SRN PTNS TS POSS SEV. 03Z WND W G25KT. OTLK...MVFR CIG SHRA...11Z WRN PTNS VFR.

NWS Advisories – the NWS had several AIRMETs current during the period:

WAUS41 KNCI 191850 AAA 2013109 1852
WA1S
-BOSS WA 191850 AMD
AIRMET SIERRA UPDT 3 FOR IFR AND MTN OBSCN VALID UNTIL 192100

AIRMET IFR...ME NH VT MA RI CT NY NJ PA DE AND CSTL WTRS
FROM 30SW MLT TO 60WSW YSJ TO 20S ACK TO SBY TO 20E EMI TO 20N
ALB TO 30SW MLT
CIG BLW 010/VIS BLW 3SM BR/FG. CONDS CONTG BYD 21Z THRU 03Z.

AIRMET IFR...PA OH WV MD VA...UPDT
FROM ERI TO 50WSW CSN TO 30N GSO TO HNV TO HNN TO 60ESE CVG TO
50NE ROD TO ERI
CIG BLW 010/VIS BLW 3SM PCPN/BR. CONDS ENDG BY 21Z.

AIRMET MTN OBSCN...ME NH VT MA NY PA WV MD VA NC SC GA
FROM 70NW PQI TO 20ESE PQI TO 30SSW HUL TO 20SSW CSN TO CLT TO
ATL TO GQO TO HNV TO HNN TO JHW TO SYR TO MSS TO YSC TO 70NW PQI
MTNS OBSC BY CLDS/PCPN/BR. CONDS CONTG BYD 21Z THRU 03Z.

OTLK VALID 2100-0300Z...IFR ME NH VT MA RI CT NY NJ PA MD DE VA AND CSTL WTRS
BOUNDED BY 50NNW PQI-60WSW YSJ-20ENE ACK-20S ORF-40E DCA-30NNW
ALB-50NNW PQI
CIG BLW 010/VIS BLW 3SM PCPN/BR/FG. CONDS CONTG THRU 03Z.

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WAUS41 KNCI 191656 AAA 2013109 1656
WA1T
-BOST WA 191656 AMD
AIRMET TANGO UPDT 3 FOR TURB AND LLWS VALID UNTIL 192100

...SEE SIGMET NOVEMBER SERIES...UPDT

AIRMET TURB...OH LE WV
FROM 70SE ECK TO HNN TO CVG TO FWA TO DXO TO 70SE ECK
MOD TURB BTN 140 AND FL350. CONDS CONTG BYD 21Z THRU 03Z.

AIRMET TURB...ME NH VT MA RI CT NY NJ PA WV MD DC DE VA AND CSTL WTRS
FROM 60ESE YQB TO 30SSE PQI TO 60WSW YSJ TO 20E ACK TO 20SE JFK
TO 20NE ECG TO 40SSW LYH TO 20NNW PLB TO YSC TO 60ESE YQB
MOD TURB BLW 080. CONDS CONTG BYD 21Z THRU 03Z.

AIRMET TURB...NY LO PA OH LE WV MD VA NC SC GA
FROM 20NNW PLB TO 40SSW LYH TO 50SW PZD TO 50SSE LGC TO GQO TO

HMV TO HNN TO CVG TO FWA TO 30SE ECK TO 20NNW PLB
MOD TURB BLW 140. CONDS CONTG BYD 21Z THRU 03Z.

.
AIRMET TURB...ME NH VT MA RI CT NY LO NJ PA OH LE WV MD DC DE VA
NC SC GA AND CSTL WTRS
FROM 60E YSC TO BGR TO 70E ECG TO 20SSW CAE TO ATL TO LGC TO GQO
TO HMV TO HNN TO 70SE ECK TO 20NNE YYZ TO YOW TO 60E YSC
MOD TURB BTN FL240 AND FL390. CONDS CONTG BYD 21Z THRU 03Z.

.
**LLWS POTENTIAL...ME NH VT MA RI CT NY LO NJ PA OH LE WV MD DC DE VA AND CSTL WTRS
BOUNDED BY 20ESE YOW-40ENE ENE-ACK-40ESE SBY-20ENE HMV-20SSW AIR-50NNW ERI-20ESE
YOW
LLWS EXP. CONDS CONTG BYD 21Z THRU 03Z.**

.
OTLK VALID 2100-0300Z
AREA 1...TURB ME NH VT MA RI CT NY NJ PA WV MD DC DE VA AND CSTL WTRS
BOUNDED BY 70WNW PQI-30ESE PQI-40ESE HUL-100SSW YSJ-80ESE ACK-
130ESE SIE-30ESE ORF-40E YSC-70WNW PQI
MOD TURB BLW 080. CONDS CONTG THRU 03Z.

.
AREA 2...TURB ME NH VT MA CT NY LO NJ PA OH LE WV MD DC DE VA NC SC GA FL AND CSTL WTRS
BOUNDED BY 40E YSC-30ESE ORF-20S SAV-30NW TLH-GQO-HMV-HNN-20N CVG-20E FWA-DXO-MSS-40E
YSC
MOD TURB BLW 140. CONDS CONTG THRU 03Z.

.
AREA 3...TURB ME NH VT MA RI CT NY LO NJ PA OH LE WV MD DC DE VA NC SC GA AND CSTL WTRS
BOUNDED BY 60NNE MSS-50SSE HUL-140E ECG-20ESE FLO-20ESE CAE-LGC-GQO-HMV-PSK-80ENE YYZ-
60NNE MSS
MOD TURB BTN FL240 AND FL390. CONDS CONTG THRU 03Z.

.
AREA 4...TURB NY LO PA OH LE WV VA
BOUNDED BY 80ENE YYZ-PSK-HMV-HNN-CVG-FWA-DXO-50N CLE-80ENE YYZ
MOD TURB BTN 140 AND FL350. CONDS CONTG THRU 03Z.

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WAUS41 KPCI 191445 2013109 1452
WA1Z
-BOSZ WA 191445
AIRMET ZULU UPDT 2 FOR ICE AND FRZLVL VALID UNTIL 192100

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AIRMET ICE...VT NY LO NJ PA OH LE WV MD DC VA NC SC GA
FROM 20N MSS TO 40WSW YSC TO SAX TO CAE TO 50SW PZD TO 50S LGC TO
40WNW ATL TO GQO TO HMV TO HNN TO YYZ TO 20N MSS
MOD ICE BTN FRZLVL AND FL240. FRZLVL 080-120. CONDS CONTG BYD 21Z THRU 03Z.

.
AIRMET ICE...OH LE
FROM DXO TO 20SE CLE TO 50WNW HNN TO CVG TO FWA TO DXO
MOD ICE BTN FRZLVL AND 100. FRZLVL SFC-020. CONDS CONTG BYD 21Z THRU 03Z.

.
OTLK VALID 2100-0300Z
AREA 1...ICE ME NH VT MA RI CT NY LO NJ PA WV MD DC DE VA NC SC
GA AND CSTL WTRS
BOUNDED BY 50W MLT-30SW BOS-40ENE CHS-20NE AMG-20NE PZD-50SW
PZD-30N LGC-40ESE VXV-HMV-20E EKN-60NNW SYR-20WSW MSS-50W MLT
MOD ICE BTN FRZLVL AND FL240. FRZLVL 080-120. CONDS CONTG THRU 03Z.

AREA 2...ICE NY PA OH LE
BOUNDED BY 20NE BUF-HNN-CVG-FWA-20NE DXO-20NE BUF
MOD ICE BTN FRZLVL AND 100. FRZLVL SFC-020. CONDS CONTG THRU 03Z.

.
FRZLVL...RANGING FROM 025-140 ACRS AREA
MULT FRZLVL 030-100 BOUNDED BY 60NE YYZ-JST-50WSW BKW-HNN-CVG-
40SSE FWA-50SW DXO-30SE ECK-20NW ERI-20WNW YYZ-60NE YYZ
040 ALG 30E CVG-40E CVG-20NW APE-40NW ERI-40WSW YYZ
080 ALG 40W BKW-20ESE JHW-100WSW YOW
120 ALG 20N GSO-20WNW CSN-50NNW ALB-20SW YSC-50E YSC-150ENE
ACK

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SIGMET November issued:

WSUS01 KPCI 191656 2013109 1656
WS1N
-BOSN WS 191656
SIGMET NOVEMBER 1 VALID UNTIL 192056
OH LE LM MI LH IN KY
FROM 50SW YVW TO CVG TO 50NNE PXV TO 30N MKG TO 50SW YVW
OCNL SEV TURB BTN 140 AND FL250. DUE TO WNDSHR ASSOCD WITH JTST.
RPTD BY ACFT. RPTD BY E135. CONDS CONTG BYD 2056Z.

Convective SIGMET current at the time:

-MKCE WST 191955
CONVECTIVE SIGMET 19E
VALID UNTIL 2155Z
SC FL GA AND FL CSTL WTRS
FROM 20WSW SPA-30NW FLO-40WSW SAV-90WSW CTY-90SW TLH-20WSW SPA
AREA SEV TS MOV FROM 27020KT. TOPS TO FL400.
HAIL TO 1 IN...WIND GUSTS TO 65KT POSS.
CONVECTIVE SIGMET 20E
VALID UNTIL 2155Z
VA NC WV SC
FROM 20SW EKN-40SW CSN-30NNE RDU-30NW FLO-20WSW SPA-20SW EKN
AREA SEV EMBD TS MOV FROM 25025KT. TOPS TO FL390.
TORNADOES...HAIL TO 1 IN...WIND GUSTS TO 60KT POSS.
CONVECTIVE SIGMET 21E
VALID UNTIL 2155Z
FL GA AND CSTL WTRS
FROM 30ENE AMG-50S SAV-50W TRV-PIE-40NW CTY-30ENE AMG
DVLPG AREA TS MOV FROM 22010KT. TOPS TO FL350.
CONVECTIVE SIGMET 22E
VALID UNTIL 2155Z
PA MD WV
FROM 20NNE PSB-20E EKN
DVLPG LINE EMBD TS 15 NM WIDE MOV FROM 25020KT. TOPS TO FL340.
OUTLOOK VALID 192155-200155
FROM SLT-SAX-90SSE ECG-110ESE CHS-70ENE OMN-30SSE TRV-RSW-70WSW
PIE-170S CEW-30ENE ODF-30NW EKN-SLT
REF WW 129 130 131 132.
WST ISSUANCES EXPD. REFER TO MOST RECENT ACUS01 KWNS FROM STORM

PREDICTION CENTER FOR SYNOPSIS AND METEOROLOGICAL DETAILS.

Center Weather Service Unit (CWSU) – meteorological impact statements issued surrounding the period:

FAUS20 KZDC 191139 2013109 1139
ZDC MIS 01 VALID 191140-192000
...FOR ATC PLANNING PURPOSES ONLY...
AREAS IFR-MVFR CIGS 005-030 ACRS ZDC SOME -DZ BR...IMPRVG 15-17Z.
SFC WIND S 10-20KT HIR GUSTS...LLWS 005-010/18035-45KT. LGT-MOD TURB
BLW 100...BLW FL420 AFT 15Z. CD FRNT MOVS INTO W ZDC AFT 15Z W/ LINE
SHRA ISOL EMBD TSRA TOPS TO FL300. TSRA COVRG SCT-BKN AFT 19Z.

Accident 2056Z

FAUS20 KZDC 192121 2013109 2122
ZDC MIS 02 VALID 192115-200600
...FOR ATC PLANNING PURPOSES ONLY...
COLD FNT/LINE RA/TSRA TOPS FL250-400 WV AND W PORTIONS VA/NC
MOV E 20 KT ACRS ZDC...OVER IAD RDU 23Z-00Z...OVER DCA BWI 01Z.
CIG 005-020 VIS 1/2SM-2SM HVYR TSRA. SFC WINDS S 10-20 KT G30 KT
SHIFTG W-NW 10-30 KT WITH FROPA 23Z-00Z IAD RDU...FROPA 01Z DCA
BWI. OCNL W WIND G30-45 KT IN TSRA. MOD ICE 100-FL280 MOD ISOL
SEV TURB BLW FL420. IMPROV VFR CIG 040 VIS 6SM FM W TO E AFT 04Z.

Pilot Reports (UA) – the following PIREPs were noted surrounding the period:

NYG UA /OV BRV010015 /TM 1920 /FLUNKN /TP A320 /TB MOD 100-050 /RM DURD TB
CONS=
RIC UUA /OV FAK/TM 2338/FL330/TP B763/TB SEV CHOP 330=
CHO UA /OV CHO045005 /TM 0042 /FL070 /TP C208 /TB MOD=
DAA UUA /OV DCA233011 /TM 0307 /FL050 /TP B733 /TB SEV=