

**NATIONAL TRANSPORTATION SAFETY BOARD**

Office of Aviation Safety  
Ashburn, Virginia 20147

July 25, 2011

**Factual Weather Information Provided by FAA and NWS**

WPR09MA141

by John Clark

**ACCIDENT**

Location: Antelope Island, Utah  
Date: March 3, 2009  
Time: 0803 MST 1503 UTC  
Aircraft: Experimental Zodiac 601XL

**SUMMARY**

Weather data were supplied by FAA and NWS.

**WEATHER INFORMATION**

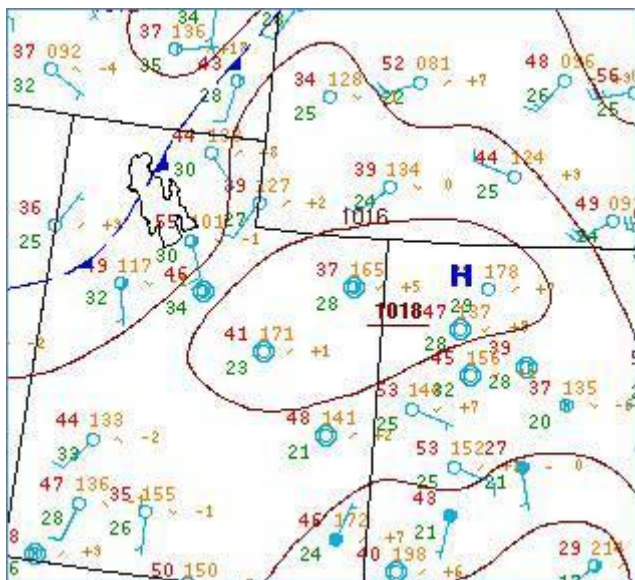
**FAA data: surface wind speeds are in knots**

TOOELE ERDA	14G22	S
HAT ISLAND	11G18	SSW
PROMATORY	23G30	SSW
SYRACUSE	4G8	SSE

CRASH LOCATION 40 57.559 N 112 13.554 W

## Synoptic conditions

NWS Surface Analysis Chart for 0800 MST (1500Z) depicted a high pressure system at 1018-hectopascals (hPa) over northwestern Colorado with a decaying cold front (frontolysis) over Wyoming, Idaho, northwestern Utah, into Nevada. The resultant pressure field resulted in southerly winds in the vicinity of the accident site.



## Observations

From Salt Lake City International Airport (SLC) located approximately 17 miles southeast of the accident site at an elevation of 4,227 feet, had an Automated Surface Observation System (ASOS), which was augmented by a NWS certified weather observer and reported the following conditions surrounding the period:

*METAR KSLC 031353Z 16016KT 10SM FEW080 SCT120 BKN150 BKN200 12/M01 A2992 RMK AO2*

*PK WND 16029/1255 SLP100 T01171011*

*METAR KSLC 031453Z 16019G24KT 10SM FEW070 SCT140 BKN200 13/M01 A2992 RMK AO2 SLP101 T01281011 55001*

***METAR KSLC 031553Z 16015KT 10SM FEW070 SCT140 BKN200 13/00 A2993 RMK AO2 SLP104***

***TCU DSNT SE T01330000***

*METAR KSLC 031653Z 17019G24KT 10SM FEW070 SCT140 SCT200 16/01 A2992 RMK AO2 SLP097 T01560006*

Hill Air Force Base (KHIF) located in Ogden, Utah, approximately 20 miles north of KSLC and 15 miles northeast of the accident site at an elevation of 4,789 feet reported the following conditions:

*METAR KHIF 031455Z 16012KT 10SM CLR 09/00 A2993 RMK AO2A SLP104 T00910001 54000*

***METAR KHIF 031555Z 16010KT 10SM CLR 10/00 A2994 RMK AO2A SLP100 T00990004***

*SPECI KHIF 031644Z 17013KT 10SM SKC 12/02 A2993 RMK SLP027*

10142 20086 58007

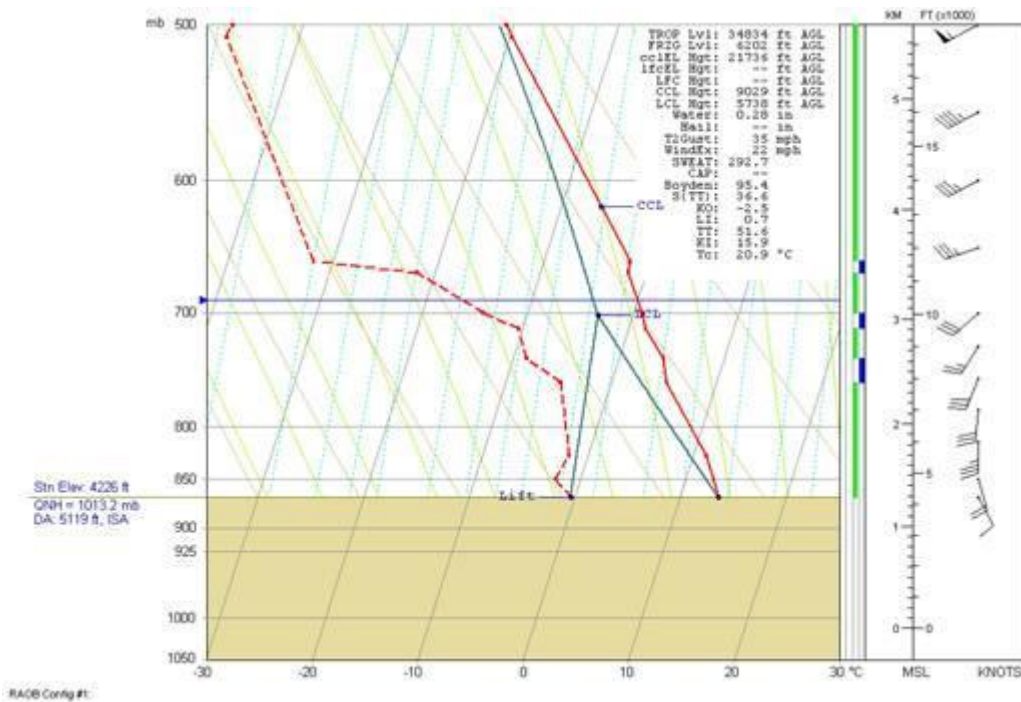
### Pilot Reports – issued surrounding the period

*Accident 1540Z*

EAST BOUND=

## Sounding

data:



Height (ft-MSL)	Pres (mb)	T (C)	Td (C)	RH (%)	DD / FF (deg / kts)	CAT (FAA)	LLWS	Icing - Type (AFGCW method)	Wave/K--W--Turb nm fpm max
4226	868	13.6	-0.4	38	155 / 8	XTR	LIGHT		
4804	850	12.6	-2.4	35	165 / 19				
5557	827	11.2	-1.8	40		SVR	LIGHT		
6000	814				180 / 34	LGT			
7000	784				185 / 30				
7882	759	5.2	-4.8	48		MDT			
8000	756				200 / 30				
8633	738	4.2	-8.8	38		MDT			6.56 2175 SEVERE
9000	728				210 / 24				
9549	713	1.6	-10.4	40		MDT			
10035	700	0.8	-14.2	32	225 / 31				
11262	668	-1.7	-21.7	20					
11616	659	-1.9	-31.9	8		MDT			4.47 890 LT-MD
12000	649				250 / 37	LGT			
14000	600				240 / 36	LGT			7.50 1775 MD-SV
16000	554				240 / 47				
18225	507	-19.9	-46.9	7		LGT			
18563	500	-20.7	-46.7	8	240 / 57	LGT			11.89 1398 MD-SV

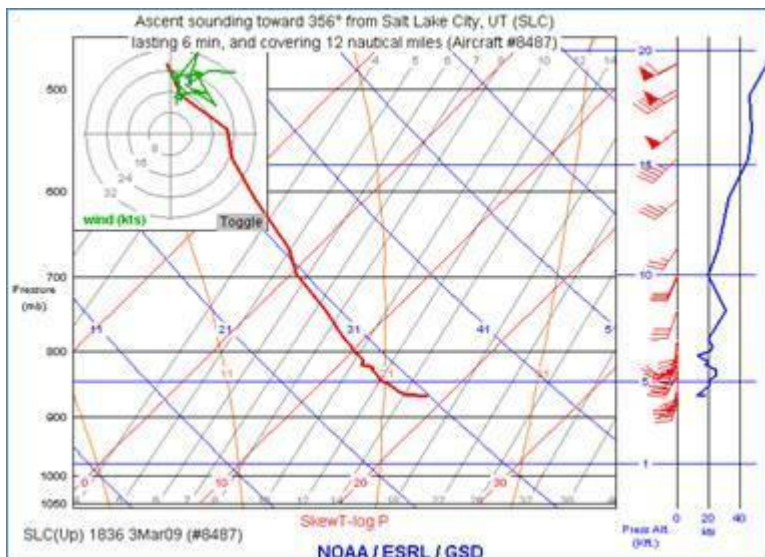
The KSLC sounding depicted southerly winds that veered to the southwest and west with height.

A low-level wind maximum was identified near 6,000 feet msl (1,774 feet agl) with wind from 180° at 34 knots, with the level of maximum wind at 35,000 feet from 245° at 142 knots. The tropopause was at 39,000 feet.

The mean 0 to 6 kilometer wind was from 254° at 38 knots. The sounding wind profile and stability supported the formation of mountain wave activity downstream of higher terrain and turbulence.

An instrumented aircraft observation (AMDAR) sounding was made at 1136 MST (1836Z) as it departed KSLC.

The observed wind and temperature profiles are included below:



SLC(Up) 1836 3Mar09  
 Ascent sounding toward 356° from Salt Lake City, UT (SLC)  
 lasting 6 min, and covering 12 nautical miles (Aircraft #8487)

P_alt (ft)	mb	t/td (°C)	w_dir/w_spd (kts)	Time (UTC)	Bng/Rng (nm)
4270	866	18.0/-----	191°/018	1836	325°/002
4270	866	18.6/-----	192°/013	1836	325°/002
4340	864	17.0/-----	201°/014	1836	315°/002
4530	858	16.1/-----	200°/017	1836	315°/002
4770	850	15.3/-----	183°/021	1836	298°/002
4781	850	15.2/-----	183°/021		
5030	842	14.1/-----	182°/021	1836	298°/002
5260	835	13.6/-----	210°/025	1836	298°/002
5510	827	12.8/-----	202°/025	1837	276°/001
5670	822	12.6/-----	240°/020	1837	276°/001
5800	818	11.6/-----	205°/018	1837	256°/002
5920	814	11.6/-----	222°/020	1837	256°/002
6060	810	11.3/-----	201°/016	1837	259°/002
6220	805	10.8/-----	200°/013	1837	261°/003
6430	799	10.1/-----	188°/022	1837	262°/003
6700	791	9.5/-----	180°/023	1837	262°/003
7000	782	8.6/-----	186°/020	1837	263°/004
8360	742	5.1/-----	199°/032	1838	277°/006
9882	700	0.8/-----	201°/021		

## In-Flight Weather Advisories

The NWS had an AIRMET for moderate turbulence below 18,000 feet over Utah surrounding the time of the accident. A SIGMET for severe turbulence extended over portions of Nevada and California west of the accident site. The relevant advisories were as follows:

### AIRMETs

WAUS45 KNCI 030845

2009062 0831

WA5T

-SLCT WA 030845

AIRMET TANGO UPDT 1 FOR TURB VALID UNTIL 031500

...SEE SIGMET ROMEO SERIES...

AIRMET TURB...ID MT WY NV UT CO AZ NM WA OR CA AND CSTL WTRS  
 FROM 50WSW YXC TO 50NNW ISN TO 50SSW BFF TO 40E SNY TO 50W LBL  
 TO 30ESE TBE TO 30ENE PGS TO 20S MZB TO 220SW MZB TO 180WSW FOT  
 TO 120W OED TO 30WNW PDX TO 20SW YDC TO 50WSW YXC  
 MOD TURB BTN FL180 AND FL400. CONDS CONTG BYD 15Z THRU 21Z.

AIRMET TURB...ID MT WY NV UT CO AZ NM WA OR CA AND CSTL WTRS  
 FROM 40SW YQL TO 70S YYN TO SHR TO 50WNW RAP TO 40E CIM TO 70SW  
 DVC TO 20NE EED TO BZA TO 20S MZB TO 40WSW RZS TO 60SW FOT TO  
 40S HQM TO 80SSE GEG TO 40SW YQL  
 MOD TURB BLW FL180. CONDS CONTG BYD 15Z THRU 21Z.

OTLK VALID 1500-2100Z...TURB AZ NM CA  
 BOUNDED BY 30ESE TBE-30SE TCC-50SSE INW-50N BZA-20S MZB-20ENE PGS-30ESE TBE  
 MOD TURB BTN FL180 AND FL400. CONDS DVLPG 15-18Z. CONDS CONTG THRU 21Z.

WAUS45 KNCI 030845

2009062 0831

WA5Z

-SLCZ WA 030845  
AIRMET ZULU UPDT 1 FOR ICE AND FRZLVL VALID UNTIL 031500

AIRMET ICE...WY NV UT CO AZ NM  
FROM 40N CHE TO 20WNW DBL TO 40ENE DBL TO 40ENE RSK TO 20SSE INW  
TO 20E DRK TO 40SSE EED TO 40ESE BTY TO 20E ILC TO 40N HVE TO  
70WSW OCS TO 40N CHE  
MOD ICE BTN 100 AND FL240. CONDS CONTG BYD 15Z ENDG 18-21Z.

FRZLVL...RANGING FROM SFC-155 ACRS AREA  
MULT FRZLVL BLW 100 BOUNDED BY 60SSE BOY-30SSE OCS-20ENE SLC-40S TWF-60SSE  
BOY  
MULT FRZLVL BLW 110 BOUNDED BY 40SSE YQL-50NNW ISN-40WSW RAP-30NNW LWT-  
40SSE YQL  
SFC ALG 40NE GEG-20WSW FCA-70S YQL-60NNW GTF-50NE BIL-50W RAP  
SFC ALG 80N FMG-40NW OAL-50NNE OAL-30NE BAM-20ENE OCS-40S BIL-80S MLP  
080 ALG 30SSW BOY-50SW SHR-30SE SHR-50ENE CZI-50WSW RAP  
080 ALG 20WSW BTY-20W ILC-50SSE BVL-20WSW OCS-60SSW BOY  
120 ALG BZA-50ENE INW-50S ALS-20ENE PUB-20SW LAA-50W LBL

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WAUS45 KKCI 031445 2009062 1451  
WA5Z

-SLCZ WA 031445  
AIRMET ICE...ID MT NV UT WA OR CA  
FROM 30NE GEG TO 70E DLN TO 40ESE PIH TO 60SSE TWF TO 30WNW BAM  
TO 40SSW FMG TO 20E OAK TO 30SW RBL TO 50S LKV TO 30NE GEG  
MOD ICE BTN FRZLVL AND 160. FRZLVL SFC-080. CONDS CONTG BYD 21Z  
THRU 03Z.

OTLK VALID 2100-0300Z...ICE ID MT WY NV UT WA OR CA  
BOUNDED BY 30NE GEG-MLS-30NNE CZI-30NNE JAC-60SW BPI-40W  
BAM-60SSW FMG-60SE RBL-30NE GEG  
MOD ICE BTN FRZLVL AND 160. FRZLVL SFC-080. CONDS CONTG THRU 03Z.

FRZLVL...RANGING FROM SFC-150 ACRS AREA  
MULT FRZLVL 030-100 BOUNDED BY 30NNE HVR-50NNW ISN-80SW DIK-  
30NNE HVR  
SFC ALG 50NNE GEG-40NW FCA-40SW YQL  
SFC ALG 40NW HVR-100SE MLS-80NW RAP  
080 ALG 40WNW BTY-30NE BPI-30SSW BIL-40ESE BIL-70WNW RAP-50W RAP  
120 ALG 70ESE BZA-60NNE SJN-40S ALS-30ESE ALS-30N PUB-40SSW  
AKO-50SE LAA

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WAUS45 KKCI 031445 2009062 1447  
WA5T

-SLCT WA 031445  
AIRMET TANGO UPDT 2 FOR TURB VALID UNTIL 032100

...SEE SIGMET ROMEO SERIES...

AIRMET TURB...ID MT WY NV UT CO AZ WA OR CA AND CSTL WTRS  
FROM 50NNW ISN TO 70SW RAP TO BFF TO GLD TO 50W LBL TO 80SW BCE  
TO 220SW MZB TO 140WSW FOT TO 100W ONP TO 140W TOU TO 20WSW HUH  
TO 50NNW ISN  
MOD TURB BTN FL180 AND FL410. CONDS CONTG BYD 21Z THRU 03Z.

**AIRMET TURB...ID MT WY NV UT CO AZ NM WA OR CA AND CSTL WTRS  
FROM 50WSW YXC TO 40N HVR TO 20N SHR TO 30SW TBE TO ELP TO 50S  
TUS TO BZA TO 20S MZB TO 40WSW RZS TO 70WSW OED TO 50WSW YXC  
MOD TURB BLW FL180. CONDS CONTG BYD 21Z THRU 03Z.**

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WAUS45 KPCI 031445

2009062 1442

WA5S

-SLCS WA 031445

AIRMET SIERRA UPDT 2 FOR IFR AND MTN OBSCN VALID UNTIL 032100

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AIRMET IFR...ID MT WA

FROM 30SSW YXC TO 30SE MLP TO 30E GEG TO 20NW YKM TO 30SE YDC TO 30SSW YXC  
CIG BLW 010/VIS BLW 3SM PCPN/BR. CONDS ENDG 18-21Z.

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AIRMET MTN OBSCN...ID MT WY

FROM 60SW YXC TO 40NNE FCA TO 40W BIL TO 20SW JAC TO 50N TWF TO  
30ESE BKE TO 60SW YXC  
MTNS OCNL OBSC BY CLDS/PCPN/BR. CONDS CONTG BYD 21Z THRU 03Z.

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AIRMET MTN OBSCN...WY UT CO AZ NM

FROM 20NE LAR TO 30WNW TBE TO 50S ALS TO 70N SJN TO 50N TBC TO  
20ESE JNC TO 40N JNC TO 20NE LAR  
MTNS OCNL OBSC BY CLDS/PCPN/BR. CONDS CONTG BYD 21Z THRU 03Z.

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