South Pole Meteorology Instrumentation Timeline

Part III – Wind Monitors

January 1957
An Aerovane wind system was mounted on a temporary 10-foot mast until the 10-meter mast arrived.

6 March 1957
Wind systems mounted on the 10-meter mast 250 feet upwind of the station: Aerovane #227 at 33 ft. above the surface; F005 and F102A at 32 ft. The Aerovane was apparently the primary wind monitor.

Also installed on this date was the Aerovane model 141-4 wind recorder.

February 1961
Aerovane wind monitor was at 9.3 meters above the surface.
F005 and F102A no longer listed.

1 August 1963
Report shows Aerovane monitor at 30 ft., connected to Aerovane recorder. The Aerovane systems were made by Bendix-Friez.

31 December 1965
Same instruments listed; wind monitor was 27 ft. above surface.

1 December 1968
Aerovane was raised from 27.5 ft. to 33.75 ft.

1 February 1969
Aerovane was at 28 ft.

31 October 1973
Aerovane was at 26 ft. Original recorder was in office and a parallel recorder was set up in the galley.

18 December 1974
Aerovane wind monitor was moved to a location upwind of the new dome station and was mounted at 30 ft. above the surface. The recorder was set up in the new office. This was the original equipment in use since 1957.

1 November 1975
Met operations transferred to the New Zealand Weather Service.

1979 Winter
The Aerovane wind monitor was in use, connected to the Bendix Friez 16-day chart as well as dial speed and direction indicators.

1981 Winter
A calibration procedure was documented for the Aerovane system.

1982 Winter
The Aerovane wind system is identified as the UMQ-5. Backup instruments were on hand for all components of the system. Appears as though two windbirds were mounted on the tower. Problems were reported with the windbirds when temperatures went below -70C.

1984 Winter
Turnover report describes two Aerovane windbirds. The primary one was "located on a short wooden tower at the standard height of about 12 feet above the surface." The secondary one was on a steel mast at about 20 feet.

1984 – 1985 Summer/Winter
The wind monitors were changed out (presumably with calibrated units) on 11-20-84. The winter-over staff recommended raising the primary wind monitor to the standard height; implies that it went through this year at a lower than standard height.

1985 – 1986 Summer
The spare windbirds were calibrated.

The primary windbird was measured to be only 9 feet above the surface, while the secondary unit was at 23 feet. They were not raised this summer.

1987 Winter
Two of the three wind monitors froze up during the winter. The primary one was only 7 ft. off the snow. The turnover report states that the FMH-1 standard was 10 ft. (?)

1991 – 1992 Summer/Winter
Wind instruments consisted of the old Aerovane wind monitor (now referred to as the UMQ-5) and chart recorder, plus two RM Young Model 05103 windbirds. The UMQ-5 and one of the RM Young's were on Met Tower 1 and the other RM Young was on Met Tower 3. All were kept at approximately the 10 meter standard height (WMO standards were now followed for the siting of instruments).

The RM Young windbird on Met Tower 1 was the primary instrument but the UMQ-5 chart was used to obtain peak wind and gust values. The digital display for the RM Young was a model 26501 Wind Translator.

Three new RM Young wind monitors were received at the end of the summer; a rotation was started where calibrated units were deployed each summer.

1993 – 1994 Summer
All three of the wind monitors were swapped out with calibrated units and were raised to approximately 10 meters.

1994 – 1995 Summer
It was noted that the speed of the wind recording chart was slightly off due to the frequency of the power plant generators. This was a common occurrence through the years, requiring frequent adjustments to the charts.

January 1996
The RM Young and UMQ-5 windbirds were calibrated by a Navy technician.

A Qualimetrics digital wind display was installed and used for hourly and synoptic observations. It displayed both the 2-minute and 10-minute average winds from the UMQ-5 wind monitor (now the primary instrument).

24 November 1997
The RM Young and UMQ-5 wind monitors on Met tower #1 were raised to approximately the 10 meter standard height. The RM Young (but not the UMQ-5) was replaced with a calibrated unit.

26 November 1997
The RM Young wind monitor on Met tower #3 was replaced with a calibrated unit.

16 November 1998
The RM Young wind monitors were replaced with calibrated units.

17 November 1999
ATS (Aviation Technical Services) personnel replaced the ancient UMQ-5 wind recording chart with an M-Tek model 2802 chart. The Qualimetrics digital wind display stopped working at this time and was replaced with an RM Young Wind Tracker model 06201. The Wind Tracker showed the 2-minute average wind and peak wind but not the 10-minute average (the chart was used for that). Both the new chart and digital display were connected to the RM Young wind monitor on Met tower #1, now the primary instrument.

The RM Young on tower #3 was connected to the older Wind Translator digital display, labeled as "Wind 2."

The UMQ-5 windbird was connected to a pair of ancient Bendix-Friez dial displays.

Both the RM Youngs were fed to the Watcher program (and minute data files) via the new Handar datalogger.

20 January 2002
The RM Young wind monitor on Met tower #1 was swapped out with a calibrated unit.

10 January 2003
Both of the RM Young wind monitors were swapped out with calibrated instruments.

3 January 2004
Both the primary and secondary RM Young wind monitors were swapped out with calibrated units.

19 January 2004
The FMQ-19 surface observing system was installed. See the Station History Timeline for more information. The FMQ-19 was to become the official observing system in February 2005.

2004 Winter
It was noted that the M-Tek wind recording chart was often off by about 15 minutes per 6 hours (it was running too fast). The paper was usually set to the correct time after the six-hourly Synoptic observations.

12 February 2005
The Met department moved from the Science Building in the dome to wing B2 of the new South Pole Station. The first official observation from the AN/FMQ-19 surface observing system was logged at 0150 UTC. Practices for manual evaluation of clouds, visibility and weather phenomena were not changed. See the supplemental document titled "2005 Met Transition" for information about the instrumentation with the FMQ-19.

The M-Tek wind recording chart and microbarograph were taken out of service at this time.

The FMQ-19 system does not log peak winds unless the speed exceeds 25 kts. (Gusts are also reported when FMH-1 criteria are met.) Therefore, for speeds under 26 kts, the "peak wind" logged on the observation forms at the synoptic intervals is actually the highest wind from the one-minute observations.

3 March 2005
On this day it was first noticed that the skiway wind monitor was showing much lower wind speeds than the Clean Air monitor. The Clean Air instrument was made the primary one for the purpose of official observations (at 0430Z) while troubleshooting began.

4 March 2005
Wind speeds from the two different towers seemed to be comparing well again and the skiway instrument was switched back to primary at 0420Z.

6 March 2005
Large differences in wind speeds from the two monitors were noted again and the Clean Air instrument was switched back to primary at 0925Z.

10 – 18 March 2005
The skiway wind monitor was worked on several times. It was replaced with a calibrated RM Young windbird, however the manual winch that raises the mounting arm stopped working in the extreme cold and the wind monitor was left a couple of meters short of the proper height. Speeds continued to appear low, and wind observations were taken from the Clean Air tower for the rest of the winter.

July 2005
Data analysis of wind readings from the Clean Air and skiway Met towers was done with help from Coastal Environmental. It was concluded that the differences between the two wind readings were real and were due to obstructions upwind of the skiway tower, i.e. the MARISAT berm and the elevated station. These obstructions cause greater directional variability at the skiway tower, which due to vector averaging, reduces the magnitude of the wind speed.

12 October 2005
The skiway wind monitor was lowered to near the surface and the directional alignment was adjusted.

18 October 2005
The skiway wind monitor was raised back to the top of the tower at 0200 UTC after the alignment was adjusted. This was done manually since the winch was still not working. The skiway instrument was designated the primary wind reading again for official observations at 0300 UTC. Hourly METAR's to support Twin Otter flights commenced at 0600 UTC.

28 December 2005
The RM Young wind monitor on the Clean Air tower was swapped out with a calibrated unit.

6 February 2006
The RM Young wind monitor on the skiway tower was swapped out with a calibrated unit.

February 2006
An equipment log was added to the department's Access database for the purpose of documenting preventative maintenance, calibrations, and repair work on Met equipment. Computer issues and data losses can also be recorded in the equipment log.

22 August 2006
Snow and frost accumulation caused the RM Young wind vanes at both towers to get stuck for several hours until Met personnel were able to service the instruments.

4 November 2006
A new TDAU server for the FMQ-19 surface observing system was installed in the station's Network Operations Center (NOC). An upgraded version of the Airport Weather Advisor (AWA) display software was loaded on the new server. This version of the AWA included requested improvements such as displaying station pressure to the tenth of a millibar and reporting six-hourly peak winds. Prior to this time, the highest one-minute average wind for each six-hour period was reported as the peak wind.

4 January 2007
The RM Young wind monitor on the skiway tower was swapped out with a calibrated unit. The alignment of the wind vane was checked using grid north markers that the station surveyors installed and it was found that no adjustment was needed.

6 January 2007
The RM Young wind monitor on the Clean Air tower was swapped out with a calibrated unit.

March 2007
Wind speed discrepancies between the skiway and Clean Air towers were noted on numerous occasions. The difference is most pronounced during winds from grid northeast, when interference from station buildings causes the skiway wind monitor to read lower speeds than the Clean Air tower. A discussion was initiated to consider alternatives for reporting wind speeds in official observations during times of large differences between the two towers. At this time the skiway wind is used for METAR, Local, and Synoptic observations.

April 2007
Wind speed discrepancies between the two Met towers continued to be observed during grid northeast winds. The meteorologists decided to occasionally adjust the reported speed up to that of the Clean Air wind monitor when it was considered necessary to make the observation representative of conditions found outside the station.

6 November 2008
The RM Young wind monitor on the skiway tower was swapped out with a calibrated unit. The wind monitor was offline between 2110Z and 2118z (Nov 5th UTC). The alignment of the wind vane was checked using the sun at grid south at 00z. Johan Booth also provided the Met Department with a sun azimuth program that calculates the azimuth of the sun at any given time of day. This program may me used in future alignments of the windbirds.

20 December 2008

Construction of the raised platform skiway tower was completed. All weather instrumentation located on the old skiway tower was relocated to the raised platform tower early Saturday afternoon. This resulted in a loss of data between 0012z and 0551z for December 20th, 2008.

15 August 2009

The International Meteorological Conference has requested for the Met Dept. to include reporting wind speed and direction from the Clean Air tower in our observations. This remark shall be recorded in Column 14 of the MF1M-10A. The two minute average shall be the value reported.

11 January 2012

Construction of the raised platform Clean Air tower was completed. The windbird located on the old Clean Air tower was relocated to the raised platform tower Tuesday afternoon and fiber splicing was completed Wednesday morning. This relocation resulted in no transmittal of data from the windbird from 1930Z on January 9th, 2012 to 2215Z on January 10th, 2012.

15 April 2012

The anemometer located on the skiway instrument tower was replaced with a calibrated unit. This was done due to extended periods of data dropouts being recorded on the AWA readout. The anemometer was offline from 2115-2119Z. The problem was initially noted in mid-March however, replacement was delayed due to extended periods of blowing snow and cold temperatures, as well as awaiting consultation with both SPAWAR and Mesotech support personnel. Since replacement, the data dropouts have returned and troubleshooting has resumed in an attempt to find the root cause of the data dropouts.