SOT ANNUAL REPORT FOR 2007

RSMC EXETER MONITORING REPORT

(Submitted by Colin Parrett, Met Office, UK)

This document provides information on the data quality monitoring conducted by the Regional Specialized Meteorological Centre (RSMC) Exeter operated by the United Kingdom Met Office.

1. **Monitoring the quality and timeliness of VOS observations**

1.1 The Met Office (RSMC Exeter), as WMO-designated lead centre for monitoring the quality of surface marine meteorological data (observations from ships, buoys and other in situ marine platforms), compares observations from individual platforms with the Met Office's global model background 6-hour forecast fields for each variable. Platforms for which the observed values differ from the background by a significant amount are flagged as suspect.

1.2 Monthly lists of suspect platforms are made available to other monitoring centres and to WMO via the Met Office web site at http://www.metoffice.gov.uk/research/nwp/observations/monitoring/index.html. An extract from the suspect monitoring list for January 2008 is attached at Annex A. Each current suspect ship can be linked to a quality plot covering the previous month, showing time-series of observation-minus-background (o-b) values. Two example time-series plots are shown in Annex B: the first plot shows a constant positive bias in pressure; the second plot shows a more variable bias in wind speed, with some unbiased speed reports during the first 9 days of January, then a persistent negative bias of 5-13ms^{-1}.

1.3 Initially only mean sea level pressure was monitored, but over the years wind speed, wind direction, sea surface temperature, air temperature and relative humidity have been added. The current monthly monitoring criteria for the 6 variables are shown in Annex C.

1.4 The Met Office also produces monthly lists of monitoring statistics for the VOS fleets recruited by certain countries. To maintain up to date VOS fleet lists for the countries concerned, the Met Office uses WMO Pub47, which should be updated quarterly. To ensure that recently recruited VOS vessels are included, the Met Office also receives monthly fleet updates from a number of countries.

1.5 National focal points are notified when the latest VOS monthly monitoring reports and suspect lists become available on the Met Office website by means of an email sent by the Met Office to the SOT and PMO mailing lists, which are maintained by JCOMMOPS. It is important therefore that focal points wishing to receive this monitoring information check that their JCOMMOPS mailing list information is kept up to date. However, the monthly monitoring statistics continue to be e-mailed directly to major VOS operating countries. Any other national focal points who may wish to receive directly e-mailed copies of the monthly monitoring lists or 'suspect' ship lists should advise the Met Office of their e-mail address.

1.6 Every 6 months more detailed marine monitoring reports are produced and made available to the WMO Secretariat via the Met Office web site (paper copies are no longer circulated). The statistics relating to suspect VOS operated by specific members are extracted from the report and distributed by the Secretariat to national focal points for the members concerned, under a covering letter requesting that remedial action be taken to correct the problems. The most recent version of the biannual report on the quality of marine surface observations can be found at:
http://www.metoffice.gov.uk/research/nwp/observations/monitoring/marine/Biannual/index.html

1.7 Timeliness information for VOS reports received at the Met Office is also available from the web site at http://www.metoffice.gov.uk/research/nwp/observations/monitoring/marine/TOR/index.html. This includes a table summarising the data timeliness for each country's ship reports as well as graphs showing the timeliness for all VOS ships and for the main VOS operating countries. A graphical example for January 2008 data is shown in Annex D, where it can be seen from the upper graph that the majority of ship reports were received promptly, with over 75% received within 40 minutes and 90% within 90 minutes of the observation time. With the cut-off time for operational NWP global data assimilation being typically 90-150 minutes after the analysis times of 00, 06, 12 and 18 UTC, at least 90% of global VOS data continues to be received in time to be assimilated. Timeliness information for individual call-signs on the Pub47 list is also available from the website.

ANNEX A

EXAMPLE OF MONTHLY SUSPECT LIST

Pub47 VOS Suspects for January 2008

Please note that the bias and standard deviation statistics listed below exclude observations having gross errors (see Annex C for gross error limits, etc.).

PRESSURE (hPa)

CTRY CODE	CALLSIGN	WMO ID	TOTAL	GE (%)	BIAS	SD	Graph
DE	ANDES BRIDGE	A8DM9	44	0	**4.4**	1.6	QC plot
DE	APL CHILE	V2OB8	40	0	**5.4**	0.7	QC plot
DE	CCNI NINGBO	A8KD9	34	3	**-6.5**	1.3	QC plot
DE	CMA CGM JAMAICA	DDRE2	37	0	**-5.4**	1.0	QC plot
DE	LONDON SENATOR	DEDM	30	0	**4.6**	0.6	QC plot
DE	VERONA	HOLP	23	**39**	-1.2	5.4	QC plot
DE	YM HIROSHIMA	V2OS3	32	0	**4.2**	0.6	QC plot
HK	OOCL China	VRWE7	21	0	**4.2**	4.6	QC plot
IN	Desh Prem	AUBC	41	0	**5.5**	2.2	QC plot
IN	Lok Pratap	VVML	27	0	**7.7**	1.9	QC plot
RU	ALEKSANDR MIRONENKO	UBAU	91	**100**	0.0	0.0	QC plot
US	APL VIRGINIA	A8HA3	35	0	**4.5**	1.9	QC plot
US	ELATION	3FOC5	38	0	**4.7**	1.2	QC plot
US	HATSU ENVOY	VSQL9	24	**29**	-1.8	5.3	QC plot
US	LNG AQUARIUS	V7BW6	48	0	**-4.1**	1.7	QC plot
US	LNG ARIES	V7BW7	48	0	**6.4**	1.0	QC plot
US	LNG CAPRICORN	V7BW8	42	0	**5.1**	0.9	QC plot
US	POLAR ENTERPRISE	WRTF	24	0	**-4.5**	1.2	QC plot
US	RADIANCE OF THE SEAS	C6SE7	21	0	**-8.7**	1.3	QC plot
US	SENSATION	C6FM8	25	0	**6.4**	1.8	QC plot
US	TROPIC DAWN	J8PR3	22	5	**13.9**	0.6	QC plot
US	TYCO DURABLE	V7DI8	26	0	**4.1**	2.7	QC plot

TEMPERATURE (deg C)

CTRY CODE	CALLSIGN	WMO ID	TOTAL	GE (%)	BIAS	SD	Graph
CA	GORDON REID	CGBR	74	0	**4.9**	1.4	QC plot
CA	JOHN P. TULLY	CG2958	240	0	**4.3**	1.8	QC plot
CA	SIR WILFRID LAURIER	CGJK	205	0	**4.6**	1.5	QC plot
IN	Palanimalai	VTXL	42	0	**-5.2**	1.5	QC plot
RU	PIONER YUZHNO¹SAKHALINSKA	UCDN	36	**58**	**7.8**	4.8	QC plot
US	ADVENTURE OF THE SEAS	C6SA3	27	0	**-6.4**	0.5	QC plot

US	BRUCE	WWU8	29	3	**7.7**	3.8	QC plot
US	MARCO POLO	C6JZ7	32	0	**4.6**	2.5	QC plot
US	VALDEZ RESEARCH	WXJ63	212	4	**4.6**	2.6	QC plot

WIND SPEED (m s-1)

CTRY CODE	CALLSIGN	WMO ID	TOTAL	GE (%)	BIAS	SD	Graph
DE	CAP SALINAS	A8HA7	40	0	**-5.6**	2.8	QC plot
DE	GREY FOX	V7LD4	47	19	**5.3**	4.4	QC plot
DE	LILY OLDENDORFF	A8AY3	43	**30**	**7.9**	4.1	QC plot
DE	SANTA ANNABELLA	DBUY	21	0	**6.8**	3.3	QC plot
DE	ZIM SAVANNAH	A8ER9	37	0	**5.1**	3.1	QC plot
GB		MINUK03	492	0	**-5.7**	4.3	QC plot

WIND DIRECTION (deg)

CTRY CODE	CALLSIGN	WMO ID	TOTAL	GE (%)	BIAS	SD	Graph
AU	KIRIBATI CHIEF	VROB	48	0	-1.5	**114.1**	QC plot
CA	LIMNOS	CG2350	22	0	**96.7**	62.4	QC plot
CA	PROVO WALLIS	CGDP	75	9	-23.4	**104.1**	QC plot
CA	TANU	CGBY	47	13	-21.3	**119.9**	QC plot
DE	CAP REINGA	A8FA6	47	0	**30.6**	40.5	QC plot
DE	LILY OLDENDORFF	A8AY3	34	**38**	-10.8	28.5	QC plot
GB		MINUK03	130	0	**-52.4**	64.4	QC plot
GB	British Harmony	MHMZ8	27	4	5.8	**84.5**	QC plot
US	ADVANTAGE	WPPO	39	0	**-31.3**	57.3	QC plot
US	TROPIC CANADA	V2OW1	25	0	**-30.2**	57.2	QC plot
US	WESTWOOD VICTORIA	C6SI6	111	1	**-41.0**	35.5	QC plot

RELATIVE HUMIDITY (%)

CTRY CODE	CALLSIGN	WMO ID	TOTAL	GE (%)	BIAS	SD	Graph
CA	JOHN P. TULLY	CG2958	240	1	**-17.6**	9.1	QC plot
DE	CMA CGM AEGEAN	ELYA5	21	0	**-25.5**	14.2	QC plot
DE	MAERSK NEWARK	A8CF2	30	0	**16.2**	19.5	QC plot
DE	RICKMERS ANTWERP	V7EG5	32	0	**15.7**	8.1	QC plot
FR		BATFR17	143	**55**	**-30.5**	14.2	QC plot
GB		TBWUK19	22	0	**17.8**	6.7	QC plot
GB	Caribbean Princess	ZCDG8	149	0	**21.8**	7.0	QC plot
HK	OOCL China	VRWE7	21	0	**15.2**	11.9	QC plot
RU	KRASIN	UIFY	74	3	**-17.7**	7.9	QC plot
US	AMSTERDAM	PBAD	50	0	**18.1**	9.2	QC plot

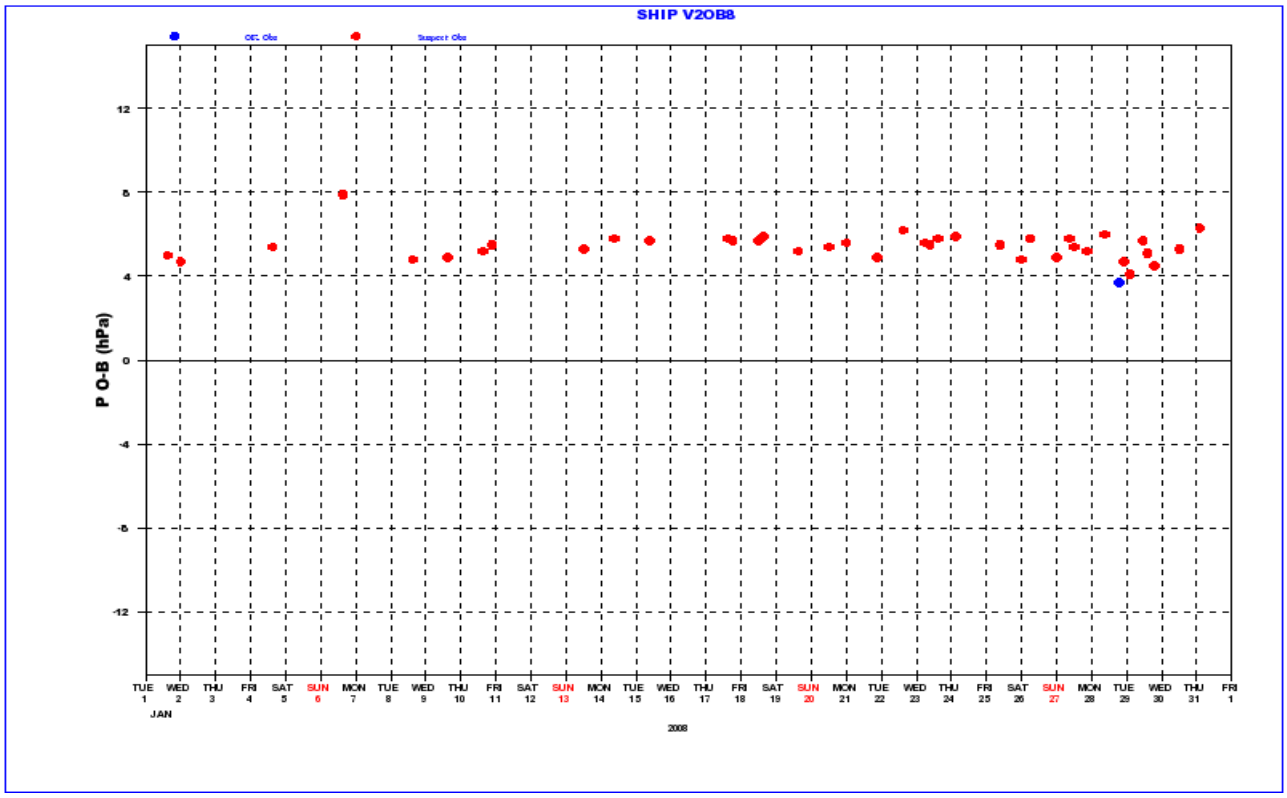
SEA SURFACE TEMPERATURE (deg C)

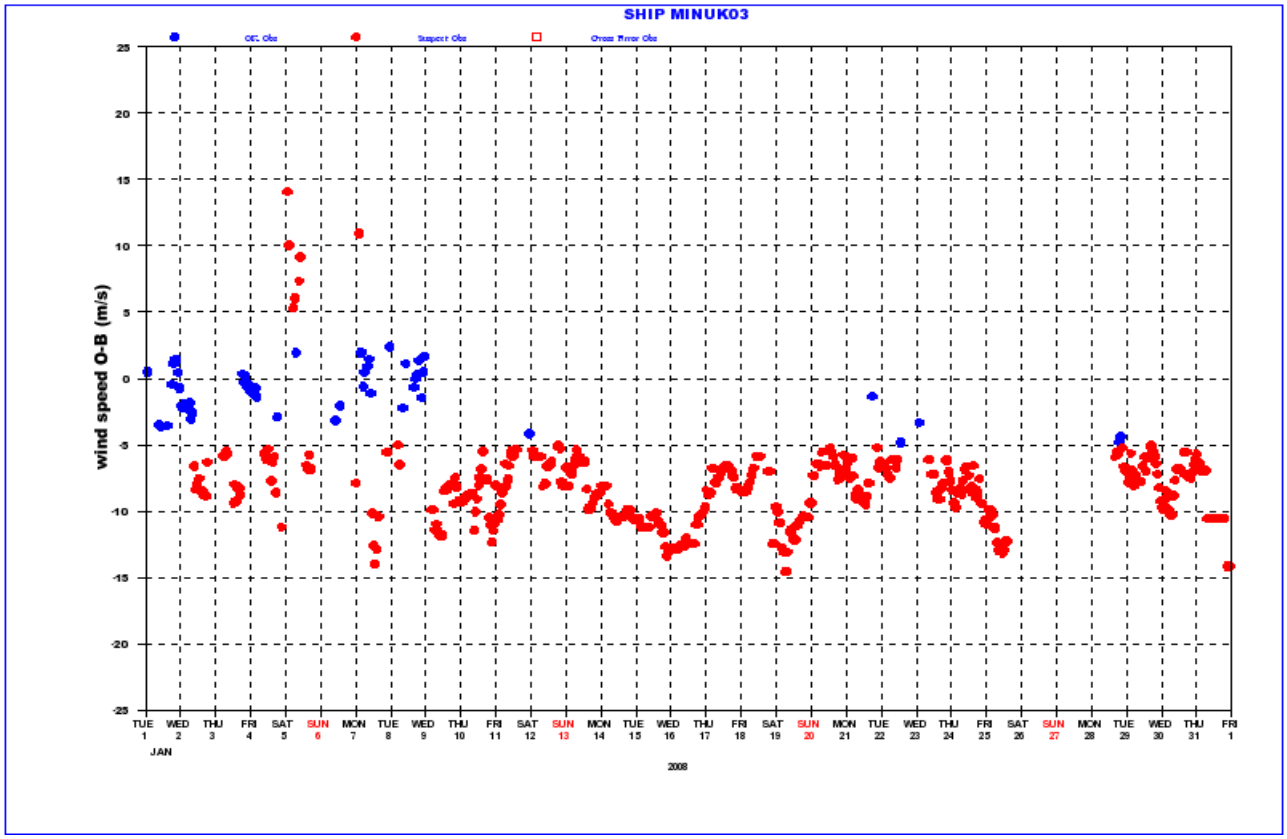
CTRY CODE	CALLSIGN	WMO ID	TOTAL	GE (%)	BIAS	SD	Graph
AU	PACIFIC FAITHFUL	A8MW2	52	2	**-7.4**	1.3	QC plot
CA	PROVO WALLIS	CGDP	143	0	**3.2**	1.2	QC plot
DE	BUXSAILOR	DEAL	26	0	**-3.3**	0.8	QC plot
DE	CMA CGM LÁSTROLABE	A8GA2	42	0	**-4.0**	2.0	QC plot

DE	CMA CGM NILGAI	A8CF3	53	2	**-5.3**	1.7	QC plot
DE	HANJIN VIENNA	DIBZ	35	0	**-3.8**	1.3	QC plot
DE	HANSA CALYPSO	DAJL	59	0	**3.3**	1.3	QC plot
DE	INDEPENDENT PURSUIT	A8HF6	51	2	**4.6**	3.0	QC plot
DE	LUISE OLDENDORFF	ELYP7	31	0	**-5.6**	1.5	QC plot
DE	OOCL NEW YORK	DPAK	59	0	**4.8**	0.7	QC plot
DE	TOKYO EXPRESS	DGTX	23	0	**4.0**	1.0	QC plot
GB		AVOUK00	48	**42**	**6.2**	2.0	QC plot
GB	Tahitian Princess	ZCDS4	30	0	**-4.2**	0.7	QC plot
NZ	TASMAN EXPLORER (MARSHALL ISLANDS)	V7DP7	24	21	**-3.9**	0.9	QC plot
RU	KHUDOZHNIK N. RERIKH	UEYO	38	0	**5.2**	1.7	QC plot
US	ALASKAN NAVIGATOR	WDC6644	64	0	**3.8**	0.6	QC plot
US	APL JAPAN	S6TS	43	2	**-3.5**	2.7	QC plot
US	STAR HANSA	LAXP4	24	**63**	-1.2	0.8	QC plot
US	TROPIC NIGHT	J8NX	24	0	**3.1**	1.5	QC plot
US	TUSTUMENA	WNGW	72	0	**-3.4**	1.2	QC plot

ANNEX B

EXAMPLES OF MONTHLY SUSPECT SHIPS





ANNEX C

Monthly monitoring criteria

Parameters monitored:

TOTAL: Number of observations received excluding duplicates.
GE: Percentage of observations with gross errors.
BIAS: Mean difference of observations from background values excluding those with gross errors.
SD: Standard deviation of difference of observations from background values excluding those with gross errors.
(Note: A positive direction bias indicates the wind observation is veered to the background.)

Gross Error limits:

15 hPa (pressure)
15 degrees (air temperature)
15 ms^{-1} (wind speed)
150 degrees (wind direction)
25 ms^{-1} (vector wind)
60 % (relative humidity)
10 degrees (sea surface temperature)

Selection Criteria:

NOBS >= 20, and one or more of the following:

1. |bias|

   >= 4 hPa (pressure)
   >= 4 degrees (air temperature)
   >= 5 ms^{-1} (wind speed)
   >= 30 degrees (direction)
   >= 15% (relative humidity)
   >= 3 degrees (sea surface temperature)

2. SD

   >= 6 hPa (pressure)
   >= 6 degrees (air temperature)
   >= 80 degrees (direction)
   >= 25% (relative humidity)
   >= 5 degrees (sea surface temperature)

3. %GE >= 25 %

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 ms^{-1}

ANNEX D

EXAMPLE OF MONTHLY TIME OF RECEIPT STATISTICS