STATUS OF GLOBAL VOS AUTOMATION AS AT DECEMBER 2011

Background

The VOSP-III meeting in London in 2003, noted the importance of enhancing the automation of all aspects of shipboard procedures, from observation to message transmission, using readily available software and hardware. The VOS Panel Chair was tasked with collating information on global VOS automation for presentation at subsequent VOS Panel sessions.

The first VOS Automation report was compiled in 2003 based on data as at 31 December 2002. The report is updated annually, with details of national VOS automation being extracted from national SOT Annual Reports. This report is based on input from national SOT Annual Reports for 2011.

Present Status

Information on the status of automation by country is presented in two categories:

- Status of VOS Automated Observing Systems (AWS) - Annex 1
- Status of VOS using (non-AWS) Electronic Logbook Software - Annex 2

AWS

The number and type of fully automated shipboard weather observing systems is slowly increasing, as countries install AWS systems on suitable ships. At the end of 2011, there were 347 operational AWS systems, an increase of 29 systems since 2010. Much of the increase came from 21 new AMOS systems installed by the United Kingdom, and first time reports from Brazil, Croatia and Indonesia have added systems to the global total. Seven countries indicated plans to expand their ship AWS networks in 2012, by proposing to add more than 20 new AWS.

E-Logbook Software

There are three main types of Electronic Logbook Software – OBSJMA, developed by the JMA, SEAS developed by NOAA and TurboWin developed by KNMI. In the early years, most countries reported a steady increase in the use of Electronic Logbook Software, but since then numbers have stabilized as software use has been maximised across national fleets.

During 2011, KNMI rationalised their manual VOS fleet, reducing numbers by 60 ships. During the same period, Japan reported an increase of 40 ships using OBSJMA, and Australia, Germany, Hong Kong, Sweden and USA all reported notable increases in ships using E-Logbook software.

A total of 2137 ships were listed as using Electronic Logbook Software at the end of 2011.

Challenges

Challenges with respect to installing Automated systems on board VOS ships continue to include:

(i) Funding restraints
(ii) Problems in finding ‘long term’ ships – the length of charter is often insufficient to justify AWS installation
(iii) Difficulties siting equipment for best exposure

(iv) Volatility of ship routes
(v) Lack of warning of withdrawal of ships and potential loss of AWS equipment

Input of Non-Synoptic AWS and Manual Observations to GTS

There are now many types of VOS AWS installations in operation. These vary from basic AWS eg a SVPB buoy transmitting from the deck of a ship; to complex systems with many sensors, which log data and transmit it in real time. Some AWS transmit at intervals of one minute, some hourly and some three hourly, and the communications method varies from coastal cellular communications to satellite communications. Many AWS are proprietary systems which report raw data back to the NMS for processing and insertion on to the GTS for global consumption.

In the past, NMS set up routines to generate GTS bulletins containing ship observations at three hourly intervals, because these captured reports made at the main and intermediate synoptic times. Today, many AWS make hourly reports and as the global models can ingest hourly data, it is important to ensure that arrangements are in place to insert the hourly AWS data onto GTS in 'non-synoptic' hour bulletins. Eg NZKL SNVE01

In addition to the hourly reporting by AWS systems, some manual reporting ships are choosing to make their observations at non-standard reporting times eg 0100, 0700 UTC because these times fit their work schedules better. These manual non-synoptic observations must also be disseminated in 'non-synoptic' hour bulletins.

Recommendations:

1. That NMS operating VOS AWS ensure that all observations, including hourly observations are inserted onto the GTS for global dissemination, using the correct Bulletin Header Data Designator $T_1T_2A_1A_2$ii starting with SNV…

2. That NMS receiving non-synoptic observations from manual reporting ships ensure that these observations are inserted onto the GTS for global dissemination, using the correct Bulletin Header Data Designator $T_1T_2A_1A_2$ii starting with SNV…

Point for discussion:

- With some AWS now reporting minute data, investigations need to be undertaken to determine whether NMS and modelling centres can ingest minute data, and if so how this data should be disseminated. One suggestion is that minute data be identified by encoding the exact UTC hour and minute in group 9GGgg of the FM13-XII SHIP code or the relevant BUFR descriptor.

Julie Fletcher
Chair, JCOMM VOS Panel
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Annex 1 : Status of VOS Automated Observing Systems (AWS)

ISO Country Code	Type of AWS (as at 31/12/2011)	Method of Comms	Manual Entry Facility	Number of ships with AWS as at end of December									Plans for 2012
				2002	2004	2005	2006	2007	2008	2009	2010	2011	
AU	Vaisala Milos 500	Inmarsat C (Data mode)	Yes	9	11	10	8	9	9	8	8	8	
	TECHSAS	Inmarsat Fleet broadband	No								1	1	
BR	Vaisala MAWS410		No									6	1 planned
CA	AVOS – AXYS Technologies	Inmarsat C	Yes	13	14	14	39	41	45	35	18	4	4-6 new AVOS
		Iridium	Yes					1	1	17	35	48	
CN	XZC6-1	Inmarsat C	Yes								47	*47*	
	XZC2-2SA	CDMA	Yes								30	*30*	
HR	BAROS		No									1	1 planned
DK	BATOS	Inmarsat C (Data mode)	Yes				2						
EUMETNET	BATOS	Inmarsat C (Data mode)	Yes					5	5	6	8	10	2 BATOS
	BAROS	Iridium SBD	No						4	9	13	15	4 BAROS
FR	BATOS	Inmarsat C (Data mode)	Yes	19	30	39	45	48	54	56	58	56	3
	Mini BATOS	Inmarsat C (Data mode)	No		1	2	3	3	1				
	MINOS	Argos	No		6	7	8	8	7	8	7	6	
	BAROS	Iridium	No					1					
DE	Vaisala Milos 500	Meteosat	Yes	23	21	21	17	18	17	16	17	17	
	Ship's own data logger	Inmarsat Iridium	Yes							2	2	2	
IE	Vaisala Milos	Meteosat	No	1	1	1	*1*	*1*	1			0	
	BATOS	Iridium	No							1	2	0	
ID	Tech Sense Met	Inmarsat	No									6	4 Planned
	Projex DX4 Pro	GPRS Cell	No									1	
JP	Integrated System for Marine Met Observation (Koshin Denki Kogyo Co)	Inmarsat / MTSAT	Some	13	12	13	9	9	9	9	6	6	
	Weather Observation System (Nippon)	Inmarsat C	Some				4	5	5	6	6	6	
	Shipboard Oceanographic & Atmospheric Radiation (Brookhaven)	Inmarsat C	Yes				1	1	1	1	1	1	
	Ogasawara Keiki Seisakusho Co (Japan)	Inmarsat C	No				3	1	1				
	JRCS MFG. Co. Ltd (Japan)	Inmarsat F	No					1	1				
NZ	Sutron 9000RTU	MTSAT	Yes	1	1	1	1	1	1	1	1	1	
	mSTAR-SHIP	GPRS Cell	No					1	1	1	1	1	
NO	AWS	VSAT	Some			17	17	18	16	15	*15*	*15*	
RU	GMS	Inmarsat C	Yes		38	*38*	*38*	*38*	*38*	0	*0*	0	
ZA	Vaisala Milos 520	Inmarsat C	Yes			1		1	1	1	1	1	
ES	Vaisala MAWS 410	Inmarsat C	Yes	1	1	1	1	1	1	1	1	1	
GB	Automet	Inmarsaat C	No	1	1	1	1	1					
	MINOS-GP	Argos	No			1	2	6	5	5	5	3	
	MINOS-GPW	Argos	No			1	2		1	1	1	1	
	BATOS	Inmarsat C (Data mode)	Yes				2	3	3	2	5	4	
	AVOS – AXYS Technologies	Inmarsat	Yes					1	1				
	Vaisala Milos/MAWS	Iridium	Yes										
	Metpod	Iridium	No						1	1			
	Metocean deck buoy	Iridium	No						2	2		1	
	AMOS	Iridium	No									21	More Planned
US	SEAS-Autoimet NOAA SCS systems	VSAT Email	Some		3	*3*	0	3	16	25	17	15	
	Non NOAA AWS	Email	No									7	
	Ship developed and implemented systems	Email	Yes								12	5	
			Total	81	140	171	204	226	248	229	318	347	

Numbers in red Italics are not confirmed

Annex 2: Status of VOS using (non-AWS) Electronic Logbook Software

ISO Country Code	E-logbook Type	Number of ships using Electronic Logbook Software as at end of December								
		2002	2004	2005	2006	2007	2008	2009	2010	2011
AU	TurboWin	33	41	50	51	64	61	58	57	72
CA	TurboWin								2	1
HR	TurboWin	3	4	3	7	*7*	*7*	*7*	*7*	0
DK	TurboWin				32	0	Finished			
FR	TurboWin		7	6	7	10	4	4	2	3
DE	TurboWin	315	412	556	600	709	730	780	800	825
GR	TurboWin	2	0	0	0	1	3	1	4	3
HK	TurboWin			1	2	2	2	2	3	22
IN	TurboWin		21	28	33	*33*	*33*	*33*	*33*	*33*
IE	TurboWin								2	2
JP	OBSJMA		49	61	70	74	95	102	100	141
NL	TurboWin	200	259	198	195	193	195	185	172	112
NZ	TurboWin	0	12	15	22	20	19	22	24	25
PL	TurboWin								61	*61*
SG	TurboWin			2	3	1	1	1	*1*	*1*
ZA	TurboWin	5	5	8	*8*	8	14	14	19	15
SE	TurboWin						1	1	3	20
GB	TurboWin	82	104	147	241	261	286	272	276	268
US	SEAS	353	439	447	622	129	344	524	507	528
	Turbowin							3		5
	Total	993	1353	1522	1893	1512	1795	2009	2073	2137

Numbers in red Italics are not confirmed