

REPORTS AND RECOMMENDATIONS BY THE TASK TEAMS

(Submitted by Task Teams)

Summary and purpose of the document

This document provides for the reports of the Chairpersons of the SOT Task Teams with their recommendations.

ACTION PROPOSED

The Team will review the information contained in this report, and comment and make decisions or recommendations as appropriate. See part A for the details of recommended actions.

- Appendices:**
- A.** Report by the Task Team on Satellite Communication Systems
 - B.** Report by the Task Team on ASAP
 - C.** Report by the Task Team on VOS Recruitment and Programme Promotion
 - D.** Report by the Task Team on Metadata for WMO No. 47
 - E.** Report by the Task Team on Instrument Standards
 - F.** Report by the Task Team on Call Sign Masking and Encoding
 - G.** Report by the Task Team on Training

- A - DRAFT TEXT FOR INCLUSION IN THE FINAL REPORT**7.1 Task Team on Satellite Communication Systems (TT-Satcom)**

(the Terms of Reference & membership of the Task Team are detailed on the JCOMM web site¹)

7.1.1 The Chairperson of the SOT Task Team on Satellite Communication Systems (TT-SatCom), Mr Pierre Blouch (France), reported on the activities of the Task Team during the last intersessional period and follow-up actions from SOT-7.

7.1.2 The team noted that a comprehensive statistics scheme was established to monitor the various satellite communication systems used by the VOS to report their observations ashore (SOT-7 Action II.20), thanks to the prST communication types entered into Pub 47 by VOS operators. Results for 2014 showed significant increases in the use of emails for conventional VOS - at the detriment of Inmarsat-C Code 41 -, and Iridium SBD for S-AWS stations. About 60% of the observations carried out by such stations are now sent ashore through Iridium SBD.

7.1.3 Mr Blouch also reported on the use of communication systems by SOOP ships. As for VOS ships, Iridium SBD and emails are more and more used for thermosalinographs and XBTs.

7.1.4 The team noted that no progress have been made on the design of a new method for conventional VOS to report their observations ashore using FleetBroadband (FB) terminals (SOT-7 Action II.18). TT-SatCom was informed that FB is not GMDSS approved yet and that Inmarsat intends to keep Inmarsat-C up and running for at least another 7-8 years.

7.1.5 In order to build a fairer funding system than this of Code 41, TT-SatCom recommends that NMSs establish separate contracts with their national Inmarsat providers in order to pay the communication costs for their recruited ships whatever the service used: Inmarsat-C now, FleetBroadband in the future (**recommendation**).

7.1.6 The team was informed that ship-to-shore E-SURFMAR dataformat #101 was defined in coordination with DMPA/ETMC and may be now used by conventional VOS (SOT-7 Action II.19). Its implementation in the most recent version of TurboWin is ongoing. Mr Blouch reminded the team that another format (#100) was defined for the S-AWS and is now operational. The description of E-SURFMAR dataformats is available on the E-SURFMAR website².

7.1.7 The team noted that no progress have been made on the adaptation of observation stations to AIS equipment (SOT-7 Action I.3). Works could start with the availability of new AWS.

7.1.8 Finally, Mr Blouch reported on the status of the migration to BUFR for ship stations. Despite Traditional Alphanumeric Codes (TAC) should have disappeared in November 2014, a few GTS centres are not reporting BUFR messages onto the GTS yet. However, it must be noted that NWP centres are not ready to assimilate BUFR ship data in their models yet. The transmission of data with both codes simultaneously can lead to problems.

7.1.9 The full report by the Task Team on Satellite Communication Systems is provided in [Appendix A](#).

7.1.10 The meeting made the following recommendations:

- (i) The Team approved the following change to the membership of TT-SatCom:
 - a. Remove: Graeme Ball (Australia) and Frits Koek (Netherlands)
 - b. Add: Joel Cabrié (Australia) and René Rozeboom (Netherlands)

¹ <http://www.jcomm.info/sot-tt-satcom>

² http://esurfmar.meteo.fr/doc/o/vos/E-SURFMAR_VOS_formats.pdf

- (ii) The Team appointed [TBD] to serve as a new Chair for the Task Team.
- (iii) VOS operators to consider adopting the E-SURFMAR dataformats for their VOS fleets or to propose alternative formats if necessary (recommendation already done at SOT-7 for the S-AWS).
- (iv) TT-Pub47 to consider the adding of a new metadata to indicate what kind of dataformat is used for the ship-to-shore communication.
- (v) The team urged GTS centres to end the migration to BUFR and data users to ingest BUFR data.
- (vi) To insert a new term of reference regarding the monitoring of the migration to BUFR.

7.1.11 The meeting decided to continue the actions which did not end:

- (i) TT-SatCom to closely work with Inmarsat Safety Services team and IMSO to propose a new method for conventional VOS to report their observations ashore using the GMDSS FleetBroadband terminals (**action; TT-SatCom; SOT-9**).
- (ii) TT-SatCom to consider the technical implications related to the compatibility between AIS equipment and observation stations (**action; TT-Satcom; SOT-9**).

7.2 Task Team on ASAP (TT-ASAP)

(the Terms of Reference & membership of the Task Team are detailed on the JCOMM web site³)

7.2.1 The SOT Task Team Chairperson on ASAP, Mr Rudolf Krockauer (DWD, Germany), reported on the activities of the Task Team during the last intersessional period and follow-up actions from SOT-7. His report focused on the EUMETNET ASAP (E-ASAP) as E-ASAP is the only programme worldwide which is based on a fleet of commercial vessels (except two research ships and one hospital ship).

7.2.2 ASAP monitoring issues are discussed under agenda item 10.1.3, and ASAP Trust Fund issues are discussed under agenda item 12.3.

7.2.3 Detailed report by the Task Team on ASAP is provided in [Appendix B](#).

7.3 Task Team on VOS Recruitment and Programme Promotion (TT-VRPP)

(the Terms of Reference & membership of the Task Team are detailed on the JCOMM web site⁴)

7.3.1 The Chair of the Task Team on VOS Recruitment and Programme Promotion (TT-VRPP), Ms Sarah North (United Kingdom) reported on the activities of the Task Team during the last intersessional period.

7.3.2 The meeting made the following recommendations:

- (i) That a summary paper and supporting documentation should be prepared immediately after SOT-8 for submission to the ICS Marine Committee;

3: <http://www.jcomm.info/sot-tt-asap>

4: <http://www.jcomm.info/sot-tt-vosrpp>

- (ii) That the VOS Scheme Questionnaire 2015 should be approved and issued to as many participating VOS as possible in order to assess the performance of the Scheme and to identify any areas where improvements may be needed;
- (iii) That the VOS Brochure and VOS Poster should be approved for use (subject to final minor editorial by the SOT Coordinator);
- (iv) That a social network group should be set up as an alternative to the Wikilog, which should then be archived;
- (v) That the potential for using video for promoting both the VOS and for training VOS Observers should be addressed jointly addressed by the VRPP and Training Task Teams after the next session, and that their ToR should be amended as necessary; and
- (vi) That the following changes be made to the membership of the Task Team:
 Remove: Graeme Ball (Australia)
 Add: Joel Cabrié (Australia)
 and
 Amend membership to show Paula Rychtar (United States) as the VOSclim Focal Point.

7.3.3 The meeting decided on the following action items:

- (i) PMOs and VOS Focal Points to keep their E-SURFMAR metadata entries for VOSclim ships up to date so that the most accurate and current ship information can be used for VOSclim DAC data processing (**action; PMOs/VOS Focal Points; ongoing**);
- (ii) The TT-VRPP Chair and KNMI to develop a simple flyer to promote the availability and use of the TurboWin software to ships that are not presently recruited to the VOS (**action; S. North & KNMI; SOT-9**);
- (iii) VOS and SOT National Focal Points to invite the national maritime administrations to consider the need for new build ships to be equipped with certified meteorological instruments (e.g. anemometers and barometers) that comply with WMO guidelines, and to consider whether this issue should be raised within IMO (**action; VOS&SOT NFPs; SOT-9**);
- (iv) The SOT Technical Coordinator to produce a final copy of the VOS Brochure (**action; M. Kramp; June 2015**);
- (v) The SOT Technical Coordinator to make any necessary final minor design adjustments to the VOS Poster (**action; M. Kramp; June 2015**);
- (vi) The SOT Technical Coordinator to make soft copies of the final VOS Brochure and VOS Poster available on the VOS website (**action; M. Kramp; June 2015**);
- (vii) The VPPP Chair to advise the Team via the VOS, SOT and PMO mailing lists when the poster and VOS brochures are finalized and available for use (**action; S. North; SOT-9**);
- (viii) The WMO Secretariat to advise whether funding could be made available for printing hardcopies of the VOS Brochure (**action; WMO Secretariat; end 2015**);
- (ix) The SOT Technical Coordinator to review the content and need for the SOT Flyer with a view to making recommendations to the TT (**action; M. Kramp; SOT-9**);
- (x) The SOT Technical Coordinator to consider how the JCOMMOPS twitter and Facebook sites could be used to promote VOS programmatic issues to a wider audience (**action; M. Kramp & TT-VRPP; SOT-9**);

- (xi) SOT Technical Coordinator to circulate details of JCOMMOPS Twitter and Facebook sites to the SOT, VOS and PMO mailing lists inviting members to join/follow (**action; M. Kramp; asap**);
- (xii) NOAA to keep the **TT-VRPP** aware of developments concerning their plans to establish a Facebook Account for their observers (**action; S. Pritchett; SOT-9**);
- (xiii) NOAA to keep the **TT-VRPP** and **TT-Training** advised of any future developments concerning their video and sea state clips (**action; S. Pritchett & P. Rychtar; SOT-9**);
- (xiv) The SOT Technical Coordinator to liaise with, and keep the **TT-VRPP** informed, regarding any further VOS video developments (**action; M. Kramp; SOT-9**);
- (xv) **KNMI** and the **TT-VRPP** to consider the feasibility of bundling training videos within TurboWin (**action; S. North & KNMI; SOT-9**);
- (xvi) The **TT-Training** to consider the potential of international PMO exchanges or secondments as a means of promoting best practice and information exchange between VOS operators (**action; P. Rychtar; SOT-9**);
- (xvii) Paula Rychtar (USA) to investigate the potential of the forthcoming voyage of the *Hermione* to promote and possibly film our VOS activities onboard (**action; P. Rychtar; SOT-9**);
- (xviii) VOS Operators to record whether SOT certificates have been issued to ships participating in the VOS Scheme on the E-SURFMAR database (**action; VOS focal Points & PMOs; ongoing**);
- (xix) The **TT-VRPP Chair** and the Task Team to keep the content of the Quick Reference Guides on the VOS website under review (**action; S. North & TT-VRPP; ongoing**);
- (xx) SOT Technical Coordinator to review the content of the SOT Promotional presentation and to include, inter-alia, updated JCOMMOPS network maps where appropriate (**action; M. Kramp; end 2015**);
- (xxi) National VOS Operators are encouraged to provide the SOT Coordinator with suitable newsworthy articles or scientific papers related to VOS activities that can be included (or linked to) on the JCOMMOPS/VOS website (**action; VOS & SOT NFPs; ongoing**);
- (xxii) SOT members, VOS operators and PMOs are encouraged to submit articles for inclusion in the *Mariners Weather Log* (**action; VOS&SOT NFPs, PMOs; ongoing**);
- (xxiii) **WMO Secretariat** and the SOT Technical Coordinator to provide the updated VOS fleet numbers for inclusion in the VOS Framework document and to upload the revised version of the document on the VOS Website (**action; WMO Secretariat & M. Kramp; asap**);
- (xxiv) While the VOS Scheme questionnaire should run for six months, to issue the questionnaire by the end of May in order that some preliminary results could be available for the PMO-V International Workshop (**action; VOS Operators, WMO Secretariat, PMOs, VOS Chair; End May 2015**);
- (xxv) **WMO Secretariat** to investigate the potential for additionally issuing the VOS Questionnaire as an online survey via the JCOMM website (**action; WMO Secretariat; asap**);
- (xxvi) The SOT Technical Coordinator to send to all PMOs and VOS Focal Point a final pdf version of the VOS Questionnaire for distribution to their participating ships (taking into account any necessary editorial amendments raised at SOT-8) (**action; M. Kramp & WMO Secretariat; asap**); and

- (xxvii) The SOT Technical Coordinator to include on the VOS website the links to WMO Publications which are of relevance to VOS related activities (**action; M. Kramp; asap**).

7.3.4 The full Task Team on VOS Recruitment and Programme Promotion report is provided in [Appendix C](#).

7.4 Task Team on Metadata for WMO Publication No. 47 (TT-Pub47)

(the Terms of Reference & membership of the Task Team are detailed on the JCOMM web site⁵)

7.4.1 The Chair of the Task Team on Metadata for WMO Publication No. 47 (TT-Pub47), Mr Graeme Ball (BOM, Australia), reported on the activities of the Task Team during the last intersessional period and follow-up actions from SOT-7.

7.4.2 The meeting agreed on the following:

- (i) The Team endorsed adding codes 80 and 85 (AWS) to Code Table 2202 (Type of meteorological reporting ship) if the VOS Ancillary Pilot Project recommends that the Pilot Project be elevated to VOS Class status.
- (ii) The Team endorsed adding code HH (hand-held digital temperature/humidity sensor) to Code Table 0801.
- (iii) The Team endorsed adding code ZZ (JCOMMOPS recruited Ancillary ship) to Code Table 1801.
- (iv) The Team endorsed a change in the location of the Pub47 XML Schema namespace variable as a result of the transfer of the VOS Website from ABOM to JCOMMOPS.
- (v) The Team requested the Secretariat to again remind VOS Focal Points and VOS program Managers not using the E-SURFMAR VOS Metadata Database operationally, to submit their national Pub47 metadata to WMO at least quarterly (by January 15, April 15, July 15 and October 15) or preferably each month.
- (vi) The Team approved a change to the membership of the Task Team to:
 - a. Remove: Graeme Ball (Australia)
 - b. Add: Joel Cabrié (Australia).
- (vii) The Team appointed [TBD] as new Chair of the Task Team.

7.4.3 The Team concurred with the proposed revised version of the Metadata Format Version 4.2 (metadata fields & descriptions, exchange formats and code tables) of WMO-No. 47 (International list of Voluntary Observing Ships), which incorporates the changes outlined above and which is provided in the annex to [Appendix D](#).

7.4.4 The meeting decided on the following action items:

- (i) Pending endorsement from the Team to transfer the VOS Website from the Bureau of Meteorology to JCOMMOPS, Members to note a change in the location of the XML Schema referenced in the XML namespace variable and update national Pub47 XML generators accordingly. (**action; Members; 1 August 2015**)
- (ii) To comply with the recommendations in the 2013 report by J R Keeley, "Data

⁵ <http://www.jcomm.info/sot-tt-pub47>

Systems relevant to JCOMM Activities”, the Task Team to further examine the requirements to collect metadata about instruments sampling rates and instrument accuracies and precision and report at SOT-9 (**action; TT-Pub47; SOT-9**);

- (iii) The Task Team to further examine the need to record the data format used to send data from ship-to-shore (**action; TT-Pub47; SOT-9**); and
- (iv) The Task Team to submit a proposal to JCOMM-5 to change the structure of Pub47 to include the new fields endorsed by the Team at SOT-7 and SOT-8 (**action; TT-Pub47; 2016**).

7.4.5 The full Task Team on Metadata for WMO Publication No. 47 report is provided in [Appendix D](#).

7.5 Task Team on Instrument Standards (TT-IS)

(the Terms of Reference & membership of the Task Team are detailed on the JCOMM web site⁶)

7.5.1 The Chair of the Task Team on Instrument Standards (TT-IS), Mr Henry Kleta (DWD, Germany), reported on the activities of the Task Team during the last intersessional period and follow-up actions from SOT-7. He addressed the key issues assigned to the Team in its Terms of Reference and identified the key areas where progress has been made since SOT-7.

7.5.2 The Team considered carefully how the project should develop in the future, so that it can help to raise the climate quality of data within VOS, and thereby contribute to the Global Climate Observing System (GCOS). With this perspective in mind, the meeting agreed on the following:

- (i) To revise the Task Teams Terms of Reference, as necessary, to reflect the proposed changes to the project;
- (ii) The Team concurred with the first edition of JCOMM TR 63 “Recommended Algorithms for the computation of marine meteorological variables” as drafted by the TT-IS and then published during the intersessional period;
- (iii) To encourage members to contribute to a revision of JCOMM TR 63 and to follow the recommendations made in that TR (**action; SOT member; SOT-9**);
- (iv) To propose the following additional variables to be added to the JCOMM TR 63 during the next intersessional period: [TBD] (**action; TT-IS; SOT-9**);
- (v) To use online questionnaires to collect information on Instrument Standard Guidelines (Appendix A) and Instrument Standard Equipment (Appendix B) and make them available to all potential users. It requested the Secretariat to liaise with the chair of the TT-IS and organize the activity as required (**action; Secretariat; SOT-9**);
- (vi) To terminate the working groups of the TT-IS (Working Group on Publications, Working Group on Automatic Weather Stations, Working Group on New Technology) as they have proven to be not practical. The TT-IS shall setup *ad hoc* Working Groups instead when needed.

7.5.4 The detailed report by the Task Team on Instrument Standards is provided in [Appendix E](#).

7.6 Task Team on Call Sign Masking and Encoding (TT-Masking)

⁶ <http://www.jcomm.info/sot-tt-is>

(the Terms of Reference & membership of the Task Team are detailed on the JCOMM web site⁷)

7.6.1 The Secretariat reported on behalf of the Chair of the Task Team on Call Sign Masking and Encoding, Mr Graeme Ball (BOM, Australia) on the activities of the Task Team during the last intersessional period and follow-up actions from SOT-7.

7.6.2 The meeting made the following recommendations:

- (i) The Team approved the following change to its membership:
 - a. Remove: Graeme Ball (Australia) as Member and TT Chair.
- (ii) The Team appointed [TBD] as replacement TT Chair.
- (iii) Members using the E-SURFMAR VOS Metadata Database operationally, to continue to maintain their **MASK** details as an alternative to submitting a quarterly advice to JCOMMOPS.
- (iv) E-SURFMAR to continue to provide JCOMMOPS with a list of current **MASK** details on a daily basis.
- (v) To establish a JCOMM Focal Point on Ship Masking, which draft Terms of Reference are provided in Annex 4 of [Appendix F](#). In particular, the Focal Point shall be responsible for managing encryption / decryption keys.
- (vi) The SOT Chair to submit the draft Terms of Reference of the JCOMM Focal Point on Ship Masking to the JCOMM Co-Presidents for their approval (**action; SOT Chair: 30/4/2015**).
- (vii) Once approved, the Chair of the Task Team to nominate someone to become the new Focal Point on Ship Masking and submit the proposal to the JCOMM Co-Presidents for their approval (**action: SOT Chair; 15/5/2015**).

7.6.3 The detailed report by the Task Team on Callsign Masking and Encoding is provided in [Appendix F](#).

7.6.4 A list of alternative callsign sequences (i.e. **MASK**) approved by TT-Masking is provided in Annex 2 of [Appendix F](#).

7.6.5. The decision of the Co-Presidents of JCOMM concerning **Security requirements for the encryption/decryption of ship's call signs within BUFR reports distributed on GTS** is provided at Annex 2 of [Appendix F](#). The approved security requirements are provided in Annex 2 of [Appendix F](#).

7.7 Task Team on Training (TT-Training)

(the Terms of Reference & membership of the Task Team are detailed on the JCOMM web site⁸)

7.7.1 The Chair of the Task Team on Training, Ms Paula Rychtar (USA) reported on the activities of the Task Team during the last intersessional period and follow-up actions from SOT-7.

7.7.2 The meeting agreed on the following:

⁷ <http://www.jcomm.info/sot-tt-masking>

⁸ <http://www.jcomm.info/sot-tt-training>

- (i) To develop global standards, practices and functions for Port Meteorological Officers

PMO exchange program: The primary deliverable from PMO-5 is the initiation of PMO exchange program between countries. This would provide an extraordinary opportunity to broaden the experience, techniques and appreciate as well as provide a different perspective in VOS support strategies.

- (ii) To make the following changes to the membership of the Task Team:

Remove: Graeme Ball (Australia)

Add: Joel Cabrie (Australia)

- (iii) Regarding action item(s) referring to the Task Team Term of Reference no. 7:

- a. To ensure that the International Maritime Organization (IMO) International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW⁹) is current and to investigate what is specifically mentioned and required about training meteorology; and to ensure that training syllabuses are based on the IMO STCW Convention (**action; SOT members; ongoing**). It would be beneficial to obtain the various academies/colleges syllabuses used in training their cadets in preparation for developing power point presentations. These power points should cover a) detailing PMO activities and the service they provide to the observing ships and b) an overview of SOT VOS and other observing practices (XBT, SOOP, ASAP).
- b. Now that TurboWin is the primary tool for compiling weather reports, to distribute copies of TurboWin e-logbook software and user manual/handbooks to the various maritime colleges/academies, and in the best case given instruction on its use (**action; SOT members; asap**).

- (iv) Regarding action item(s) referring to the Task Team Term of Reference no. 9:

- a. To revise the Marine Observers Handbook and the NWS Handbook No. 1, and edit it to include updates (**action; P. Rychtar; asap**).
- b. To establish a sub-committee to accomplish this revision (**action; TT-Training; asap**).

7.7.3 The detailed report by the Task Team on Training is provided in [Appendix G](#).

Appendices: 7

9 <http://www.imo.org/OurWork/HumanElement/TrainingCertification/Pages/STCW-Convention.aspx>

APPENDIX A

REPORT BY THE TASK TEAM ON SATELLITE COMMUNICATION SYSTEMS

(Submitted the Chairperson, Task Team on Satellite Communication Systems, Mr Pierre Blouch – France)

1) Task Team members

- Pierre BLOUCH (France)
- Graeme BALL (Australia)
- Sarah NORTH (United Kingdom)
- Frits KOEK (the Netherlands)
- Annina KROLL (Germany)
- Michail MYRSILIDIS (Greece)
- Hiroshi OHNO (Japan)
- Steven PRITCHETT (USA)
- Paula RYCHTAR (USA)
- Derrick SNOWDEN (USA)
- Johan STANDER (South Africa)

2) The Task Team addressed its Terms of Reference as detailed below.

ToR no.	Terms of Reference	Action(s) undertaken during the intersessional period
1	Evaluate the operational and cost-effective use of satellite data telecommunication systems for the real-time collection of VOS and SOOP data in support of the World Weather Watch, GOOS, and GCOS;	<p>Statistics have been carried out on the systems used by VOS to report their observations ashore in 2014. They show significant increases in the use of:</p> <ul style="list-style-type: none"> - emails (cost borne by shipping companies) at the detriment of Inmarsat SAC41 and SEAS for conventional VOS; - Iridium SBD and emails for S-AWS. About 60% of the messages of such stations are now sent through this reliable, global and cost-effective system. <p>The study of the possibility to adapt observation stations to AIS equipment did not start yet.</p>
2	Design a new communication system for conventional VOS based on their future FleetBoardband GMDSS terminals to replace Inmarsat Code-41;	<p>The replacement of Inmarsat-C with Inmarsat FleetBroadband (FB) service for the GMDSS is a long way. It should take 7-8 years from now to see the disappearance of Inmarsat-C. Despite this, more and more ships are equipped with FB. This gives the opportunity to now build new procedures for conventional VOS to report their data ashore free of charge.</p>
3	Continue to evaluate the operational use of Iridium Satellite data telecommunication technology for the real-time collection of VOS and SOOP data in support of the OBS, GOOS, GCOS, and Natural Disaster Prevention and Mitigation applications;	<p>As written above, Iridium SBD is more and more used by S-AWS. This is also the case for SOOP ships (XBT and TSG). Different dataformats are used by S-AWS: FM13 (Canada), ASCII CSV (Met Office), binary (E-SURFMAR #100). In order to better know dataformat practices, the TT-SatCom recommends to create a new metadata in Pub47 to identify it.</p>
4	Continue to monitor the cost implications of Inmarsat satellite communications sent by Code 41;	<p>With the significant decrease in the use of Inmarsat-C SAC 41 (unfair from a financial point of view), the issue is becoming less and less important.</p> <p>However, the team recommends that NMSs establish separate</p>

		contracts with their national Inmarsat providers in order to pay the communications for their recruited ships whatever the service used: Inmarsat-C now, FleetBroadband in the future. E-SURFMAR recommends the use of its dataformat #101 through Inmarsat-C. This latter will be implemented in TurboWin soon.
5	Review all relevant JCOMM Publications to ensure that they are kept up-to-date and comply with the Quality Management terminology;	No publication was reviewed during the intersessional period.
6	Report to the next SOT Session on any relevant issues/proposals.	During the intersessional period, the Task Team was interested in the migration to BUFR. Some GTS centres are still using TAC codes only for ship observations whilst these codes should have disappeared in Nov. 2014. In parallel, NWP centres are not ready to assimilate BUFR data in their models yet. The Task Team proposes that its Term of Reference are extended to BUFR issue considerations. A more detailed report is given in Annex of the present Appendix.

3) Recommendations of the Task Team to SOT-8

- (1) The Team to approve a change to the membership of TT-SatCom to:
 - i. Remove: Graeme Ball (Australia) and Frits Koek (Netherlands)
 - ii. Add: Joel Cabrié (Australia) and René Rozeboom (Netherlands)
- (2) The Team to appoint a new Chair.
- (3) VOS operators are encouraged to establish separate contracts with their national Inmarsat providers in order to pay the communications for their recruited ships.
- (4) VOS operators to consider adopting the E-SURFMAR dataformats for their VOS fleets or to propose alternative formats if necessary (recommendation already done at SOT-7 for the S-AWS).
- (5) TT-Pub47 to consider the adding of a new metadata to indicate what kind of dataformat is used for the ship-to-shore communication.
- (6) The team to urge GTS centres to end the migration to BUFR and data users to ingest BUFR data
- (7) A new term of reference to be inserted with regards to the monitoring of the migration to BUFR.

ANNEX 1 OF APPENDIX A

I. Communication systems used by VOS ships in 2014

The use of Pub47 metadata prST field now allows statistics to be computed on the methods used by VOS to report their observations. For 2014, metadata available at the beginning of 2015 were applied to the FM13 SHIP messages received by Météo-France during the past year, from the GTS and from Environment Canada (with unmasked callsign).

The statistics include data fitted with a masked callsign but exclude observations fitted with 'SHIP' as identifier, as well as observations reported in FM13 by moored buoys and other fixed platforms. Observations sent with a callsign which is present neither in the Pub47 metadata, nor in the list of masked callsigns are ignored.

Figure 1 and 2 shows the percentage of observations transmitted through different telecommunication systems by conventional VOS and S-AWS, respectively. Metadata prST is still missing for 6.9% of the observations sent by conventional VOS but only 0.3% of those sent by S-AWS. Two years ago, prST was globally unknown for 24% of the observations.

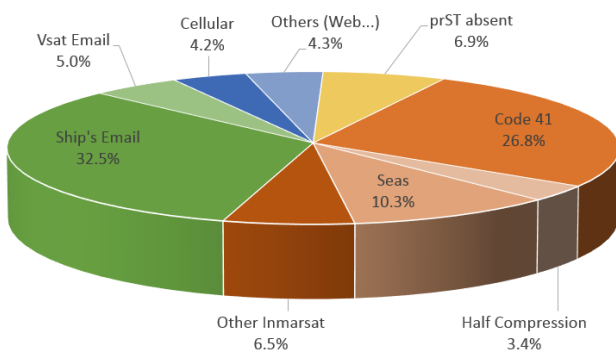


Figure 1 – Conventional VOS (2014)

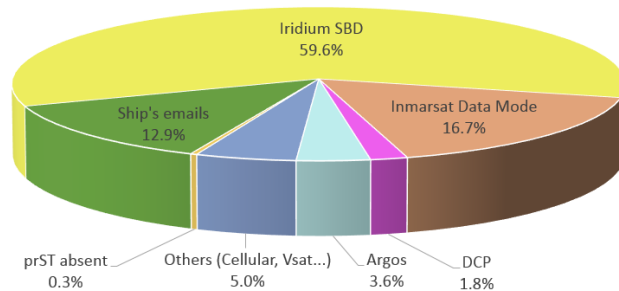


Figure 2 – Shipborne AWS (2014)

1. Conventional VOS (~640,000 observations).

- Ship's email (32.5%) is now the main way used by conventional ships to send their observations ashore. This is twice more than two years ago. It must be reminded that shipowners accept to bear the communication costs in that case. These latter may be negligible compared to their overall communications.
- Inmarsat-C (SAC 41) is now in second position with 26.8% instead of 36% two years ago. Since the SOLAS/GMDSS system is under review, this way will completely disappear in a few years. It should be replaced by another way allowing the ships not to bear the communication costs (see section III).
- SEAS (10.3%) is still used by U.S. recruited ships. In 2012, this way, based on Inmarsat-C Data mode, represented 15% of the observations reported by conventional VOS.
- E-SURFMAR compression technique (3.6% against 2% in 2012) did not progress a lot during the SOT intersessional period. The technique was developed to reduce Inmarsat-C text (e.g. SAC 41) communication costs. A revival is expected with the implementation of dataformat #101 in TurboWin (see section IV).
- Other Inmarsat (6.5%) mainly cover Inmarsat-C text messages sent outside SAC 41 and E-SURFMAR protocols.
- For information, a few UK recruited ships are sending their observations ashore through TurboWeb (requires an IP connexion). This method should become

increasingly popular in the coming years but will need company level agreements.

2. Shipborne AWS (~1,200,000 observations).

- a. Iridium SBD (59.6% in 2014 against 45% in 2012). This communication system is the main used to report observations from S-AWS. It is reliable, global, cost effective, bi-directional and easy to use. It has been adopted by:
 - i. Environment Canada for their AVOS S-AWS fleet. Ship-to-shore message format is presently FM13-SHIP;
 - ii. UK Met Office for their AMOS S-AWS. Raw data are sent ashore through a CSV format;
 - iii. Meteo-France for their BATOS AWS (migration from Inmarsat-C data mode). Raw data are binary;
 - iv. E-SURFMAR BAROS and EUCAWS. Raw data are binary (dataformat #100).
- b. Inmarsat-C Data Mode (16.5% instead of 13% in 2014). In 2014, this system was still used for E-SURFMAR and Meteo-France BATOS AWS - which were not upgraded with Iridium SBD -, and for a few MILOS stations operated by BoM. Raw data are binary (compressed binary version of FM13 SHIP in the Australian case).
- c. In 2014, ship's email was used for 12.9% of the observations sent by S-AWS, instead of 2% in 2012. The increase is mainly due to the use of this way by DWD for their AWS in replacement of the Meteosat DCP transmission. At the opposite, the use of DCPs fell down from 9% to 1.8%.

II. Communication systems used by SOOP ships

As for VOS ships, Iridium is more and more used by SOOP ships. This is mainly the case for CSIRO (Quoll XBT system) and NOAA (XBT and TSG) - even if Inmarsat-C is still used by some systems for this latter. Japan is also still using Inmarsat-C (SAC 41) as well as email for both XBT and TSG, whilst the Australian Bureau of Meteorology (BoM) uses Argos for their Devil XBTs. France uses emails through either Inmarsat for deep-sea vessels, or GSM (cell phone) for coastal ships.

III. News from Inmarsat

The Task Team on Satellite Communications was informed that Inmarsat intends to keep Inmarsat-C up and running for at least another 7-8 years. Inmarsat-C was launched in January 1991 and there are still no plans to shut it down. When Inmarsat decide otherwise, they will have to submit IMO at least 5-year notice so that international maritime community has time to migrate to another safety system.

Inmarsat has Distress and Urgency priority voice services available now through FleetBroadband (FB) but they are not GMDSS approved. These services meet IMO Resolution A.1001(25) requirements of section 3 apart from para 3.6 "Restoration and spare satellites" whereby Inmarsat is not able to restore FB service on a spare/contingent satellite in case of a failure of a prime satellite. Thus, current FB Distress and Urgency voice services are not GMDSS/SOLAS approved. Inmarsat is aware of this issue and is working on a solution how to sort it out. At the same time Inmarsat is working on the next generation of FBdata safety services to enhance and improve Inmarsat-C type safety services including Code 41 and other services as well. They plan to have a prototype FB maritime safety terminal at the end of 2015.

IV. E-SURFMAR binary ship-to-shore dataformats

During the intersessional period, some minor changes were brought to E-SURFMAR dataformat #100. This dataformat, which is now stable, was adopted for the European Common S-AWS

(EUCAWS). It is already used by the OceanoScientific station to report meteorological and oceanographic observations ashore.

It should be recalled that dataformat #100 is lighter than BUFR and so, more cost effective. The compression is higher and metadata are not transmitted by the ship herself. They are added to observation data by a processing centre that makes the BUFR before GTS transmission.

A similar dataformat (E-SURFMAR #101) was designed for conventional VOS. The goal was here also, to reduce the size of the weather messages in order to decrease the communication costs. This dataformat was the subject of discussions with the JCOMM Expert Team on Marine Climatology (DMPA/ETMC) and was then endorsed after modifications. Its implementation in the most recent version of TurboWin is ongoing.

A description of E-SURFMAR dataformats may be downloaded from:
http://esurfmar.meteo.fr/doc/o/vos/E-SURFMAR_VOS_formats.pdf

V. Migration to BUFR

During the intersessional period, the Task Team on Satellite Communications was interested in the migration to BUFR.

By mid-March 2015, almost all centres reporting VOS ship data onto the GTS were producing BUFR messages (template TM308009). However, Meteo-France reported that no BUFR ship data were received from BoM, Environment Canada and the Indian Department of Meteorology.

Despite the shutdown of alphanumeric messages (TAC) was planned for last November, Numerical Weather Prediction (NWP) centres seem not ready to assimilate BUFR ship data yet. So, FM13 SHIP messages are still transmitted onto the GTS in parallel of BUFR data. This may pose problems. For instance, FM13 messages sent onto the GTS are converted into BUFR by NOAA and sent back onto the GTS despite native BUFR messages already exist for the concerned observations. Native BUFR may have a better accuracy than FM13 in observation times and they may include metadata and/or parameters which cannot be sent in BUFR.

SOOP ship data are also sent in BUFR onto the GTS: template TM315004 for XBT, TM308010 for TSG. As for the VOS, GTS centres are urged to end the migration and data users to ingest BUFR data. Japan is producing both type of data with minor defaults which should be corrected soon. NOAA has been producing BUFR messages for their XBTs for two years but they were not received in Europe until mid-March 2015. Australia plans to start the sending of BUFR messages for XBT on the 3rd of April 2015. France still produce TAC messages only.

E-SURFMAR tries to maintain webpages up to date on the subject on ECMWF wikiste:
<http://software.ecmwf.int/wiki/display/TCBUF/E-SURFMAR>

Pierre Blouch
20th March 2015

APPENDIX B**REPORT BY THE TASK TEAM ON ASAP**

(Submitted by Mr Rudolf Krockauer, Chairperson of the JCOMM ASAP Task Team)

1) Task Team members

- Rudolf KROCKAUER (Germany)
- Sarah NORTH (United Kingdom)
- Johan STANDER (South Africa)
- Hiroshi OHNO (Japan)
- Association of Hydro-Meteorological Equipment Industry (HMEI) representative (Associated Member)

2) The Task Team addressed its Terms of Reference as detailed below.

ToR no.	Terms of Reference	Action(s) undertaken during the intersessional period
1	Coordinate the overall implementation of the ASAP, including recommending routes and monitoring the overall performance of the programme, both operationally and in respect of the quality of the ASAP system data processing;	The European E-ASAP is the only operational ASAP programme worldwide which is mainly based on merchant ships. Coordination, implementation etc. is performed by the ASAP Task Team Chairperson under his tasks as E-ASAP Operational Service Manager. Further ASAP operations are performed on board some Japanese Research Vessels and occasional campaigns of other Research Vessels.
2	As may be required by some members, arrange for and use funds and contributions in kind needed for the procurement, implementation and operation of ASAP systems and for the promotion and expansion of the programme;	No funds and/or in kind contributions available.
3	Coordinate the exchange of technical information on relevant meteorological equipment and expendables, development, functionality, reliability and accuracy, and survey new developments in instrumentation technology and recommended practices;	Done within the framework of the European E-ASAP.
4	Review all relevant JCOMM Publications to make sure they are kept up to date and comply with Quality Management terminology;	Coordination with JCOMMOPS & SOT TC regarding ASAP metadata. Quality Management of the European E-ASAP (ca. 85% of all soundings) is handled by the EUMETNET Observations Programme Management.
5	Prepare annually a report on the status of ASAP operations, data availability and data quality	Annual SOT reports are submitted to JCOMM SOT.

3) Recommendations of the Task Team to SOT-8

1. Introduction

The number of ships which routinely provide upper air soundings on the GTS throughout the year is around 21 worldwide. Occasional campaigns of some further research vessels contribute to the total amount of soundings.

After the reduction of the Japanese ASAP fleet from 5 to 2 research ships in 2010, there is only one significant ASAP programme left: The European (EUMETNET) E-ASAP fleet with 18 ships plus one 'laid up' station in NE Iceland (operated as land station since 2010).

E-ASAP is the only programme worldwide which is mainly based on a fleet of commercial vessels (plus two research ships and one hospital ship). Therefore the report of the ASAP Task Team is focused on E-ASAP.

2. Basics

Following key differences to land based radiosonde stations shall be pointed out:

- 15 out of 18 stations in the E-ASAP fleet are installed on commercial container vessels. The ships sail with 15-20 knots (producing strong turbulences at the launcher) and undergo heavy vibrations from the machinery (thus shortening the lifespan of the technical equipment). Routine maintenance is limited to short berthing times in the port.
- Transmission of sounding data to the NMS is only possible through satellite communication. Satellite communication is generally less reliable than land based cable communications.
- ASAP stations on merchant ships are operated by members of the ships crews, not by professional observers. Skill and experience depend on the respective operator/crew member.
- Japanese ASAP ships are research vessels of the JMA (Japan Meteorological Agency) and Japan Agency for Marine-Earth Science and Technology (JAMSTEC). Since the stations are operated by skilled staff there are less technical and operational problems than in the E-ASAP fleet.

3. E-ASAP fleet

Table 1 lists 18 active E-ASAP ships (status Feb 2015). 10 out of 18 stations (ASEU- and ASDE-) are operationally managed by the E-ASAP management team of the Deutscher Wetterdienst DWD in Hamburg, Germany. The other stations are part of the E-ASAP fleet but managed by the NMS's of France (ASFR-), Denmark (ASDK-), and Spain (ASES01). The naming convention of the stations in the E-ASAP fleet is as follows:

Char	Content
1, 2	AS (fixed data type, i.e., 'Aerology' and 'Ship')
3, 4	ISO alpha-2 country code ('EU' for EUMETNET)
5, 6	Sequential number

This unambiguous naming convention is an efficient ship masking scheme which could also be applied to other ASAP stations outside the E-ASAP fleet.

Table 1: Ships in the E-ASAP fleet in Dec 2014

Station	Service	Sounding equipment
ASEU01	No regular service, Research ship	The ship is equipped with a 10' container launcher and Vaisala MW31 inside the container. Launches are usually carried out by the electronic engineer (system administrator).

Station	Service	Sounding equipment
ASEU02	Northern Europe – Chile	The ship is equipped with a 10' container launcher and Vaisala MW31 on the bridge. Launches are usually carried out by the officers and cadets.
ASEU03	Northern Europe – East coast US	The ship is equipped with a 10' container launcher and Vaisala MW31 on the bridge. Most crew members are involved in launching operations.
ASEU04	Montreal – Northern Europe	The ship has a 10' container launcher portside and a manual deck launcher starboard. The Vaisala MW31 system is installed on the bridge. Launches are usually carried out by two cadets on board.
ASEU05	Northern Europe – East coast US	The ship is equipped with a 10' container launcher and Vaisala MW31 on the bridge. Most crew members are involved in launching operations.
ASEU06	Northern Europe – East coast US	The ship is equipped with a 10' container launcher and Vaisala MW31 on the bridge. Most crew members are involved in launching operations.
ASDE01	Northern Europe – East coast US	The 20' container launcher was replaced by a manual deck launcher. The sounding system Vaisala MW21 is placed on the bridge. Most crew members are involved in launching operations.
ASDE02	No regular service, Research ship	The 20' container launcher is equipped with a Vaisala MW21. Launches are carried out by a professional observer of Deutscher Wetterdienst DWD.
ASDE03	Northern Europe – East coast US	The ship is equipped with 2 manual deck launchers starboard and portside and Vaisala MW21 sounding system on the bridge. Most crew members are involved in launching operations.
ASDE04	Northern Europe – Chile	The ship is equipped with an manual deck launcher and Vaisala MW21 on the bridge. Launches are usually carried out by the officers and cadets.
ASDK01	Denmark – West coast Greenland	The ship is equipped with a 10' container launcher. The Vaisala DigiCORA III (MW21) sounding system is installed on the bridge.
ASDK02	Denmark – West coast Greenland	The launcher is integrated in the ship. The Vaisala DigiCORA III (MW21) sounding system is installed on the bridge.
ASDK3	Denmark – West coast Greenland	The ship is equipped with a 10' container launcher. The GRAW GS-E sounding system is installed on the bridge.
ASFR1	North West Europe – French West Indies	The ship is equipped with a open deck launcher and MODEM SR2K sounding system in the wheelhouse. Launches are usually carried out by the electricians.
ASFR2	North West Europe – French West Indies	The ship is equipped with a open deck launcher and MODEM SR2K sounding system in the wheelhouse. Launches are usually carried out by the electricians.
ASFR3	North West Europe – French West Indies	The ship is equipped with a open deck launcher and MODEM SR2K sounding system in the wheelhouse. Launches are usually carried out by the electricians.
ASFR4	North West Europe – French West Indies	The ship is equipped with a open deck launcher and MODEM SR2K sounding system in the wheelhouse. Launches are usually carried out by the electricians.
ASES01	No regular service, Hospital ship	The 10' container launcher is equipped with a Vaisala DigiCORA III (MW21). Launches are usually carried out by the 1st officer.

The number of participating ships in the reporting period 2013-2014 was 18. However, some stations had to be transferred to other ships due to changes in the trade pattern of the ships. EUMETNET is mainly interested in soundings in the North Atlantic. If ships leave this geographical area for new services the station is transferred to another ship.

Table 2 shows the development of the E-ASAP fleet since 2003.

Table 2: Development of the fleet from 2003 to 2014.

Year	Ships leaving the E-ASAP fleet ¹⁾	Ships joining the E-ASAP fleet	Active stations at the end of the year
2003	- 1	+ 1	13
2004	- 0	+ 1	14
2005	- 1	+ 4	17
2006	- 1	+ 0	16
2007	- 1	+ 0	15
2008	- 4	+ 1	12
2009	- 1	+ 4	15
2010	- 0	+ 4	18 + 1 temporary land station
2011	- 1	+ 1	18 + 1 temporary land station
2012	- 2	+ 2	18 + 1 temporary land station
2013	- 1	+ 1	18 + 1 temporary land station
2014	0	0	18 + 1 temporary land station

¹⁾ Usually due to changes in the trade pattern of the ships (i.e. routes away from the North Atlantic).

Figures 1 and 2 demonstrate the different types of launchers on board the ships.



Figure 1: Examples of 10ft container launchers.



Figure 2: Examples of manual launchers.

4. Performance of the E-ASAP fleet

The performance of the ASAP stations is included in the annual EUMETNET SOT ASAP report. Figure 3 shows the spatial distribution of bulletins in 2014 on a $2 \times 2^\circ$ grid without interpolation.

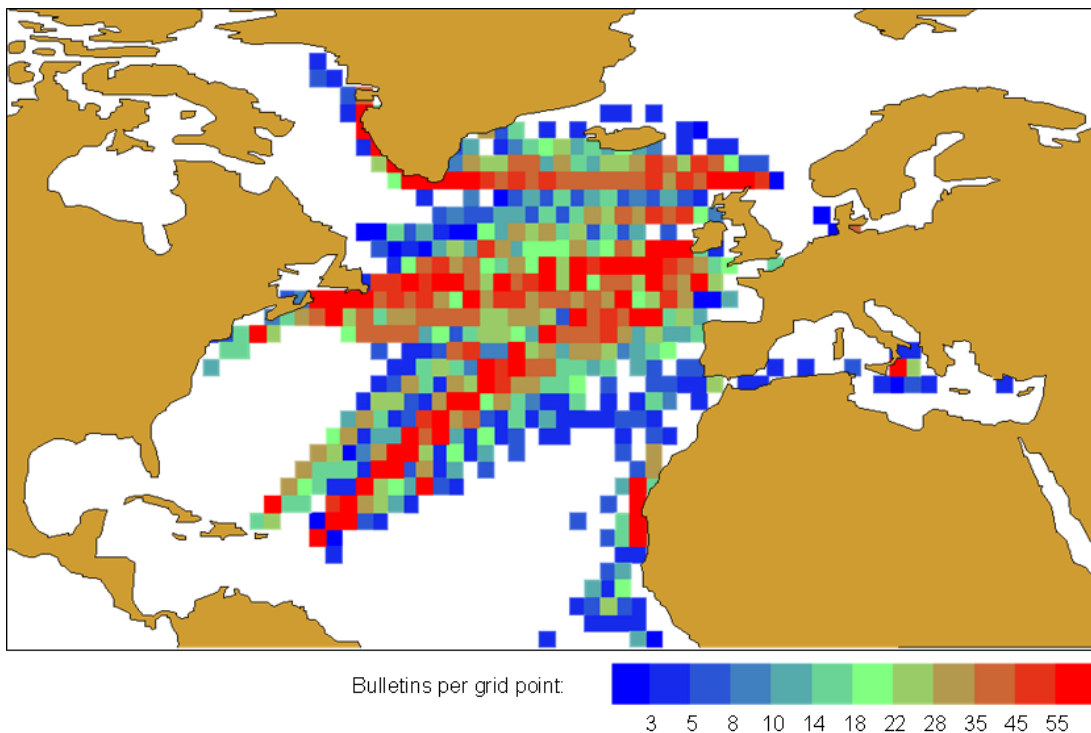


Figure 3: Distribution of TEMP bulletins in 2014 on a $2 \times 2^\circ$ grid without interpolation.

The distribution demonstrates the main trading routes between Europe and North America of the participating container vessels. Basically, there are three legs:

- Northern leg: Denmark – Greenland,
- ‘Fifties’ leg: along 50°N ,
- Southern leg: Channel – West Indies.

The individual performances differ widely from month to month and from ship to ship. Red spots away from the three main legs are soundings performed on board the Research Vessels MARIA S. MERIAN and METEOR (Mediterranean) and the Spanish hospital ship

ESPERANZA DEL MAR (off West Africa).

The total number of soundings on the GTS was 4216 (without temporary land station in Iceland) in 2014. Taking into account the total number of launches on board versus the received soundings on the GTS, the average output (GTS/Launches ratio) was 89%. Main reasons for failed launches are

- technical problems of the equipment,
- unfavourable wind conditions at 15-20 knots sailing speed,
- unexperienced operators, and
- poor satellite communication.

5. Other ASAP ships

Table 3 lists five ships providing ASAP soundings on the GTS in 2014. The Japanese Met Service JMA operates an ASAP station on board the research vessel RYOFU MARU in the western north Pacific and seas adjacent to Japan. JAMSTEC (JAPAN AGENCY FOR MARINE-EARTH SCIENCE AND TECHNOLOGY) operates a station on the oceanographic research vessel MIRAI. In total, 429 soundings were received from the Japanese ASAP ships in 2014.

The German research vessel POLARSTERN operates in polar regions in the summer periods (Apr-Sep in the Arctic, Oct-Mar in the Antarctic) and provided 421 soundings. The Swedish research vessel ODEN provided 324 soundings during an Arctic campaign in Jul-Sep as temporary ASAP station ASUK02. The German research vessel SONNE performed 76 soundings in the Indian Ocean in Jul-Aug. These three research vessels transmit their upper air data to the GTS but do not cooperate with any WMO or regional ASAP programme

Table 3: Japanese ASAP ships.

Ship name	Station	Area	Sounding equipment	Received soundings in 2014
Mirai (JAMSTEC)	JNSR	North West Pacific	Semi-automatic Container, Vaisala sounding system, Vaisala RS92 GPS radiosondes, Inmarsat-C satcom.	267
Ryofu Maru (JMA)	JGQH	North West Pacific	Semi-automatic Container, Vaisala sounding system, Vaisala RS92 GPS radiosondes, DCP satcom	162
Polarstern	DBLK	Arctic and Antarctic	unknown	421
Oden	ASUK02	Arctic	unknown	324
Sonne	DFCG	Indian Ocean	unknown	76

6. Satellite communication and migration to BUFR

All 18 ships in the E-ASAP fleet are equipped with Iridium satcom systems to enable binary HiRes Bufr reporting from the ships. Most ships report HiRes Bufr and TEMP. The average timeliness of all stations in the E-ASAP fleet in 2014 was around HH+20 min.

Soundings from the two Japanese stations are transmitted via Inmarsat-C or DCP (through Meteosat). The timeliness of the soundings on the GTS in 2012 was HH+157 min.

The vertical resolution of the HiRes Bufr of the E-ASAP stations is 10 sec (ca. 50 m) plus mandatory and significant levels. Purpose is to limit the file size to <20 Kbyte to reduce transmission time. A vertical resolution of 50 m is fully compliant to the minimum WMO requirements (Goal = 100 m, Breakthrough = 200 m, Updated on 28 May 2010).

Data exchange in BUFR format became standard WMO practice in 2010. The Commission for Basic Systems (CBS) set the deadline for the distribution of alphanumeric codes for category 1 data (SYNOP, TEMP, PILOT, and CLIMAT) to November 2014. As of November 2014 only BUFR are to be disseminated to the GTS.

The EUMETNET Observations Programme Management and the E-ASAP Operational Service Management agreed to comply with the CBS decision. Since November 2014 only BUFR is transmitted to the GTS from all stations which transmit their data to the Regional Telecommunication Hub Offenbach (i.e. ASDE01, ASDE02, ASDE03, ASDE04, ASEU01, ASEU02, ASEU03, ASEU04, ASEU05, ASEU06, ASES01). The other stations of the E-ASAP fleet (ASFR1, ASFR2, ASFR3, ASFR4, ASDK01, ASDK02, ASDK3) shall follow by June 2015.

The dissemination of E-ASAP sounding data in TEMP format shall end in June 2015. Only BUFR is to be disseminated as of July 2015 from all 18 ships of the E-ASAP fleet.

7. Summary and recommendations

In total, around 5466 soundings were received in 2014 from all ASAP stations worldwide. The distribution is as follows:

- 77% E-ASAP,
- 8% POLARSTERN,
- 5% MIRAI, 3% RYOFU MARU, 6% ODEN, 1% SONNE.

The spatial distribution is shown in figure 4.

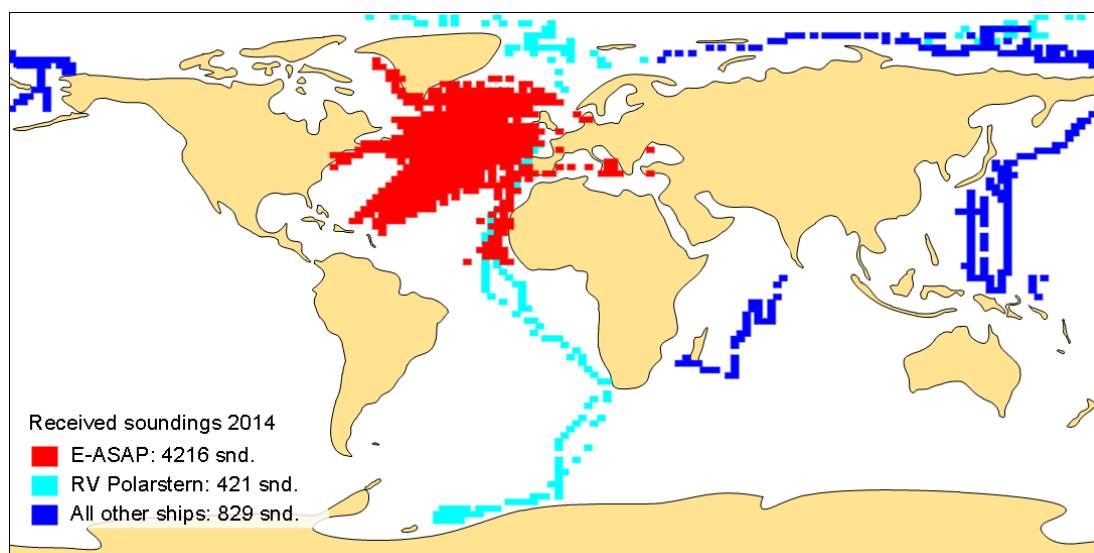


Figure 4: Distribution of global ASAP soundings from sailing ships in 2014.

The spatial distribution of global ASAP soundings show clearly the predominant and unique coverage of the North Atlantic by the European E-ASAP fleet.

Scientific studies confirm the positive impact of upper air soundings in data sparse ocean

regions. WMO members are therefore encouraged to participate in global ASAP observations by operating ASAP stations on board ships.

APPENDIX C

REPORT BY THE TASK TEAM ON VOS RECRUITMENT AND PROGRAMME PROMOTION
(report submitted by the acting Chair of the Task Team, Ms Sarah North – United Kingdom)

1) Task Team members

- Sarah NORTH (United Kingdom)
- Graeme BALL (Australia)
- David BERRY (United Kingdom)
- Pierre BLOUCH (France)
- Santjie DU TOIT (South Africa)
- Eric FREEMAN (United States) - VOSclim DAC
- Annina KROLL (Germany)
- Gerie Lynn LAVIGNE (Canada)
- Steven PRITCHETT (United States)
- Paula RYCHTAR (United States)
- Johan STANDER (South Africa)
- VOSclim Focal Point

2) The Task Team addressed its Terms of Reference as detailed below.

ToR no.	Terms of Reference	Action(s) undertaken during the intersessional period
1	Promote and monitor the upgrading of existing ships to VOSclim class standard (Action by DAC and VOSclim Focal Point)	<p>The Task Team recalled that following the decision to include VOSclim as a dedicated class of VOS, the VOSclim FP, the DAC and the VOSclim scientific advisors had been included as members of the TT-VRPP. At the last session Paula Rychtar (US) was appointed as the new VOSclim Focal Point to champion and promote the cause of VOSclim. The TT noted that Graeme Ball (Australia) would be standing down from membership of the TT at SOT-8 and thanked him for the valuable contribution he had made to the work of the TT over the years. The TT recommended to amend the list of its membership accordingly.</p> <p>The revised VOSclim Certificate had now been issued to all VOS operators and PMOs and was posted on the VOS website in February 2014 (at http://www.bom.gov.au/jcomm/vos/resources.html). The certificate now bears the new VOSclim logo and is available in Arabic, Spanish, Chinese, French and Russian.</p> <p>Following the decision taken at SOT-7 the E-SURFMAR metadata database is now used as the primary listing for participating VOSclim ships. Consequently all operational software at NCDC to parse VOSclim reports has been updated to read/use the E-SURFMAR VOSclim_list.csv file, and on 1 January 2015 the NCDC ceased using their DAC ship list. VOS operators were advised of this change in procedures by the VOSclim DAC on 9 January 2015, via the SOT, VOS and PMO mailing lists.</p> <p>PMOs are therefore no longer required to send VOSclim recruit/withdrawal information to NCDC and VOSclim ship metadata is no longer held in multiple locations. The ship list previously held on the DAC website has been discontinued and, instead, links are provided to the VOSclim ship list held at ESURFMAR.</p> <p>PMOs and VOS Focal Points are therefore strongly encouraged to keep their E-SURFMAR metadata entries for VOSclim ships up to date so that the most accurate and current ship information can be used for VOSclim DAC data processing (Action</p>

		<p>PMOs/VOS Focal Points). VOS operators are however still encouraged to share ship diagrams and photos for the DAC website as there is presently no extraction process at the DAC to gather these from the E-SURFMAR database. However such diagrams and photos should in the first instance be uploaded to the ESURFMAR database.</p> <p>NCDC will continue to parse VOSclim observations from multiple data streams and make them available on the DAC website (http://www.ncdc.noaa.gov/data-access/marineocean-data/vosclim/data-management-and-access) along with monthly statistics and suspect ship lists generated by the UK Met Office.</p> <p>The VOS website is now the primary access point for information related to VOSclim and links to the VOSclim data sets which are available to climate users via the DAC website. The text of the VOSclim class the section of the VOS website entitled ‘VOSclim Requirements for PMOs’ was also reviewed following the last session, although no major changes were made.</p> <p>Following the decision to include VOSclim as a dedicated VOS Class the JCOMMOPS mailing list for VOSclim focal points has been discontinued</p> <p>Attached at Annex A to this report are graphs produced by the RTMC showing;</p> <ul style="list-style-type: none"> • The Number of VOSclim ships reporting each of 6 variables at least 5 times per month (averaged over 12 month periods), and • The Number of VOSclim ships reporting each of the 6 main variables at least 5 times per month (averaged over 12 month periods) <p>The TT noted that there had been a steady rise in the volume of observations from VOSclim ships although not to the extent hoped for at the last session. Similarly the number of participating ships had not risen significantly and now stood at ~382 VOSclim Class and ~116 VOSclim (AWS) class ships (According to E-SURFMAR database on 15 March 2015)</p> <p>It was noted that 521,280 delayed mode observations from 358 VOSclim Class ships were processed by the Global Collecting Centres in 2014 accounting for 68% of all VOS data.</p> <p><i>[Note – The status of VOSclim participation and the associated Key Performance Indicators for VOCLIM ships will be further addressed under SOT agenda item 8.2.1.]</i></p> <p>The TT noted that the decision by the US to start using TurboWin electronic logbook software would greatly help increase future VOSclim participation and the availability of the delayed mode VOSclim parameters. Moreover it was noted that, following decisions taken by E-SURFMAR, new versions of the TurboWin software would require the VOSclim parameters to be recorded.</p>
2	Liaise with Scientific Advisors to monitor and report on compliance with VOSclim class	<p>Whilst the VOSclim dataset hadn’t been greatly used in recent years The Scientific Adviser (Dave Berry) advised the TT that there is now probably enough data to start making statements about the quality of the VOSclim data.</p> <p>However it was difficult to draw comparisons to the regular VOS and make any statements about how they compare. This is mainly because the loss of call signs from the VOS data stream since 2007 made it extremely difficult to differentiate between</p>

	<p>requirements (Action by DAC and VOSCLim Focal Point)</p>	<p>VOSCLim and non VOSCLim ships in ICOADS (which is the primary source of VOS data used by climate researchers)</p> <p>The Scientific Adviser reported that even with the all VOS observations (both VOS & VOSCLim) we now know less about the marine environment, at least for some of the GCOS Essential Climate Variables, than we did 25 years ago. This is due to the loss of sampling over a large area of the ocean. The move to automated high frequency observations does not address this as the observations tend to be concentrated along the shipping lanes. By way of example he provided maps (at Annex B) showing the uncertainty in the monthly mean air temperature (°C) from the VOS for 1988 (top) and 2014 (bottom). The TT noted that the Scientific Adviser planned to submit a paper on addressing this issue for publication in an academic journal.</p> <p>Consequently, as raised at the last session, there remains a need for the delayed mode VOSCLim data and call signs to be fully available in ICOADS. (the actions placed on the DAC and ICOADS therefore remain ongoing)</p> <p>In this respect it was noted however that the VOSCLim DAC is assisting ICOADS by providing delayed-mode observations, from the GCCs, with REAL call signs to, where possible, replace reports in the ICOADS data base originally transmitted over the GTS with masked call signs.</p> <p>The TT recalled that at the last session the scientific advisers had expressed a preference for the enhanced VOSCLim parameters to be collected from as many VOS as possible (i.e. to upgrade to VOSCLim wherever possible). The roll out of new TurboWin software versions should therefore help greatly in this respect.</p>
<p>3</p>	<p>Progress the generic pre-installation design recommendations with a view to developing 'best practices' guidance that can be used by shipowners when ordering new ships, liaising with the ICS, WOC, IMO, WMO Secretariat, IACS etc., as appropriate</p>	<p>It was recalled that the VRPP Chair had raised the need to progress the design standards at an informal meeting with the International Chamber of Shipping (ICS) in March 2011. At this meeting the industry had responded positively but had suggested that it would be preferable to develop a 'best practices' guidance document rather than making formal approaches to IMO or involving the IACS. Unfortunately there had been no substantive progress since that time, although the issue was raised within the World Ocean Council (WOC) meeting held at UNESCO-IOC, Paris, and 12-13 December 2011. A further WOC meeting, called the Sustainable Ocean Summit (SOS), was held in Washington in April 2013 and was attended by major shipping and oil companies and by Secretary General of the ICS. One of the themes discussed at the meeting was Industry data collection for Ocean Weather and Climate. The report of these meetings are available via the WOC website at</p> <p>http://www.oceancouncil.org/site/resources.php</p> <p>A further WOC SOS is planned for 9-11 November 2015 in Singapore</p> <p>In order to further progress this issue of design standards the VRPP Chair recently requested an informal meeting at ICS headquarters, which was held on 6 March 2015. Nick Ashton, who regularly represents WMO at IMO, was also in attendance. This meeting was generally positive and the ICS were supportive of SOT ambitions. However it was recognised that the issue had evolved in recent years and would need to be considered within the wider context of discussions taking place within IMO on the development of an e-navigation implementation strategy.</p> <p>Further discussions will take place on the e-navigation concept at the IMO's Maritime</p>

		<p>Safety Committee meeting to be held in June 2015. It was recognised that the concept would need a considerable amount of development but felt that the transmission of weather observations, especially using AWS systems, would fit well with the concept. In particular it might be considered within the remit of automatic reporting for coastal states.</p> <p>In considering the Generic Design Recommendations (attached for reference at Annex C) ICS offered to assist by facilitating contact with the International Association of Classification Societies (IACS) to help progress the content and determine the best way forward. It was recognised that for most ships very minimal assistance (financial or material) would be needed from shipowners other than to take account of our needs when ordering their new-builds.</p> <p>ICS also offered to co-sponsor a submission to IMO on the basis of the safety and environmental benefits. They also suggested, however, that it would be preferable if at least one IMO member state could also co-sponsor the paper.</p> <p>In order to progress the matter they requested WMO (SOT) to prepare a short paper summarising concisely what we are looking for, and highlighting the benefits to shipowners as well as the wider environmental and safety benefits. This could then be presented to the ICS Marine Committee to be held in late May when strategic decisions could hopefully be taken. If the Marine Committee is supportive then the issue would probably be referred on to the ICS Construction Committee and their Environment Committee. In this regard it was suggested that some of our proposed requirements could perhaps be considered for inclusion in the ICS Bridge Procedures Guide.</p> <p>Accordingly the TT invites the Team to consider these developments and to task it with developing a summary paper for submission to the ICS Marine Committee.</p> <p>In order to support the paper the VRPP Chair also drew attention to the recently developed VOS poster and revised VOS brochure (see ToR items 4 and 7 below) and offered to submit copies as background information for their Marine Committee.</p> <p>Discussions with ICS also addressed the question of how to increase the volume of available VOS data necessary for higher resolution models, yet in the face of diminishing NMS resources and reductions in the size of national manned VOS fleets. In this respect the VRPP Chair suggested that the ICS might wish to make its members aware of the TurboWin and TurboWeb software that could be made freely available to all its member associations' ships as a means of 'crowd-sourcing' observations from ships that aren't formally recruited to a national VOS fleet.</p> <p>The TT recognised however that the concept of crowd-sourcing additional data, that was likely to be of lower quality than for the VOS, may need further consideration at SOT-8. Nevertheless the VRPP Chair suggested that a simple Flyer to promote the availability and use of the TurboWin software might therefore be of value and should be developed (Action VRPP Chair/KNMI). She also drew attention to the consideration that would be given at SOT-8 to the idea of developing a separate fleet of observing ships and vessels that could support the established higher quality VOS fleet, and to the planned extension of the WoW website to include amateur marine observers.</p> <p>It was also recalled at the meeting that a couple of years ago ICS had discussions with</p>
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		<p>the Scientific Community for Oceanic Research (SCOR) concerning their OceanScope proposals to promote partnerships between the Maritime Industries and the Ocean Observing Community. It is understood however that these discussions have not progressed any further.</p> <p>The VRPP Chair also drew ICS's attention to the fact that many new ships were being equipped with sophisticated meteorological instruments. In particular new gas carriers were often equipped with calibrated barometers that provide pressure output to the bridge consoles. She regretted however that there were no requirements in SOLAS to require such instruments to comply with WMO guidance. The TT therefore recommended that VOS/SOT Focal points should raise this issue with their national maritime administrations with a view, possibly, to the issue being raised within IMO (Action VOS/SOT Focal Points).</p>
<p>4</p>	<p>Review existing promotional aids (flyer, certificate) and recommend new promotional aids.</p>	<p><u>VOS Brochure</u></p> <p>The TT recalled that following approval at SOT-7 the Brochure was referred to the SOT Coordinator for final editorial review in liaison with the Task Team. Although work of the revision had been subject to some delays, a further draft of the brochure was subsequently circulated to the TT by the SOT Coordinator in early January 2015. This has since been subject to numerous comments from TT members and a further revised draft was circulated on 12 March 2015</p> <p>A copy of the latest draft of the Brochure is attached at Annex D. It is intended to be a more integrated brochure, which covers all the observing systems in a more balanced way.</p> <p>Although the brochure is almost ready there still remain some minor editorial amends to complete. In particular the cover page may need some additional design improvements and the proposed inclusion of a third party map showing VOS tracks needs to be addressed. In this latter respect it is the general view of the TT that including such third party maps should be avoided, although it recognized that until such time as individual tracks are available on the JCOMMOPS viewer there were limited alternatives available at present</p> <p>The TT decided that the SOT coordinator should continue gathering comments necessary to finalise the brochure but with a view to it being published shortly after SOT-8. In particular it was considered that the brochure should be finalised in good time so that copies can be made available at the 5th International PMO Workshop, to be held in Vina del Mar, Chile, 20-24 July 2015</p> <p>The Task Team recommended that the Team should be invited to approve the proposed content and tasked the SOT Coordinator with producing the final copy by no later than June 2015 (Action SOT Coordinator).</p> <p>It was recalled that an action had already been placed on the VRPP Chair at SOT -7 to circulate the final brochure to the PMO, VOS and SOT mailing lists, with a recommendation that it should replace any existing copies, and that KNMI should be requested to replace the soft copy currently included in the TurboWin program. It was further agreed that a soft copy the final VOS Brochure should be made available on the VOS website, which will in due course transfer to JCOMMOPS (Action SOT Coordinator).</p> <p>It was recognised that having hardcopy copies of the VOS brochure printed would be</p>

more convenient for distributing to prospective VOS ships and shipowners and to make available at marine organisation meetings. However it is understood that WMO funding may not be available to publish hardcopies at the current time. The WMO Secretariat was invited to clarify whether funding could in future be made available for this purpose (**Action WMO Secretariat**)

SOT Flyer & SOT Certificates

The TT noted that SOT flyer and SOT certificate were unchanged from the last SOT meeting and remained available on the VOS website at

<http://www.bom.gov.au/jcomm/vos/information.html> and
<http://www.bom.gov.au/jcomm/vos/resources.html>

Although the flyer was very rarely being used, and its value questioned, the Task Team considered that its content remained valid although it was recognised that the logos used in the flyer may need to be revisited to ensure they comply with WMO/IOC requirements. It was recommended that the SOT Coordinator should review the content and need for the Flyer with a view to making recommendations to the TT (**Action SOT Coordinator**).

The TT noted that a facility to allow VOS operators to record whether SOT Certificates had been issued had now been added to the E-SURFMAR database and was accessible via an icon on the main line entry for each ship. As this facility is rarely used at present it was recommended that VOS operators should make efforts to record whether SOT certificates had been issued (**Action VOS focal Points & PMOs**). This would therefore avoid the risk that a ship participating in multiple SOT programmes might be issued with duplicate certificates by different national meteorological services

Other Promotional Documents

The TT noted that these included...

- IMO MSC Circular 1293 on participation in the VOS Scheme
- Various scientific studies showing the impact of VOS data
- VOS Quick Reference Guides for PMOs and VOS Programme Managers

The VPPP and SOT Chairs reviewed the content of the Quick Reference Guides and generally considered that their content remained valid. However the TT will need to keep the content under review to accommodate recent developments e.g. use of email to send observations, ship AWS inspections etc (**Action VRPP Chair and TT**)

The TT recognized that IMO MSC Circular 1293 may need further review depending on future submissions to IMO (ToR 3 above refers) and decisions regarding the future composition of the VOS fleet

VOS Poster

In accordance with the actions arising from the previous session the VRPP Chair drafted a new VOS Poster which could be used to help to promote the VOS at international Conferences and other forums. This provoked considerable input from Task Team members and a copy of the latest draft is attached incorporating members comments is attached at **Annex E**.

The US VOS program have already advised that they would like to use the poster as a template for their poster sessions at conferences such as the annual American Meteorological Society conference and annual National Weather Association meetings

in order to help ensure VOS has a bigger presence.

High resolution images have been included in the draft poster and logos should now comply with IOC/WMO requirements. The TT recommends that the SOT Coordinator should make and necessary final minor design adjustments to the Poster and arrange for the final copy to be posted on the JCOMMOPS website by not later than June 2015 **(Action SOT Coordinator)**

The VPPP Chair undertook to advise the Team via the VOS, SOT and PMO mailing when the poster is finalized and available for use **(Action VRPP Chair)**

Social Media

The VRPP Chair proposed the idea of using social media sites such as Facebook, Twitter, LinkedIn etc. at the last session as a means to encourage greater participation and involvement in the VOS Scheme. Such sites could perhaps also be used for posting articles and notifying changes or developments of interest related to observing. Accordingly the TT was invited to investigate the potential of using social media sites to promote the VOS with a view to making future recommendations to SOT

In considering this issue further the TT noted that JCOMMOPS had established a twitter feed at <https://twitter.com/jcommops> . The SOT Coordinator advised that this twitter should cover all JCOMM and associated programs on the JCOMMOPS radar. He explained that the reason it contained more information concerning Argo float and drifter deployments was because they were considered to have a stronger media visibility. He also advised that it automatically also feeds a JCOMMOPS facebook page. Because there are social media features on the new JCOMMOPS site, the TT considered that this was a sensible approach for promoting VOS (and other SOT) programmatic issues to a wider audience and requested the SOT Coordinator to determine, in liaison with the Task Team, how best to progress this issue. **(Action SOT Coordinator& TT-VRPP Team)**

To further promote the JCOMMOPS twitter and Facebook sites the SOT Coordinator was also requested to circulate details to the SOT, VOS and PMO mailing lists inviting members to join (**Action SOT Coordinator**).

In considering this issue the TT also noted that the US was also currently seeking administrative permission to establish a facebook account for their observers. NOAA was requested to keep the TT aware of developments **(Action NOAA)**. It was also noted that the National Data Buoy Center had a long established active Facebook site that allowed subscribers to regularly receive news and photos on their activities (e.g. moored buoy deployments), strong weather conditions met by their buoys (e.g. hurricanes), etc

In addition it was noted that the NCDc had a Facebook account that could also potentially be used to promote VOS issues more widely

The TT recognized that in order for any such social media site to be successful you not only need contributors to provide the content, but the content needs to be kept fresh with something new posted at least every couple of weeks and ideally more frequently. It is also necessary to be clear about who the target audience is intended to be, and to have someone to monitor the content on a regular basis to ensure that followers are replied to promptly when required

Marine Observers Log

The TT noted that the marine observers Log (WikiLog) established over a decade ago at http://esurfmar.meteo.fr/wikilog/index.php/Main_Page was, unfortunately, rarely being used by VOS operators nowadays. This was most likely because it requires some knowledge of HTML and takes time and effort to add reports to the site.

The TT therefore agreed that the time was right to consider developing an alternative more user friendly site where additional phenomena reports or interesting sightings could be added directly by ships observers.

In this respect it was suggested that a (closed) network group should be set up (e.g. using Linked-In or Facebook). Such a group would be dedicated to general marine observations such as the phenomena observations currently recorded in TurboWin However it was recognized that someone would need to be appointed to maintain and moderate the information being posted

Given the increased use of TurboWin software and the increased availability of the internet on ships, it was recognized that such a site/group would provide a good method of increasing interaction with VOS and other marine observers whilst also allowing their colleagues and families ashore to comment on the observations. The TT therefore recommended that the Team should that consider establishing such a network group an alternative to the Wikilog, which should then be archived.

Promotional and Training Videos

The TT noted that the SOT Coordinator had started a project to create a video entitled 'This is TurboWin' to promote the use of TurboWin and to give an impression of the work of a shipboard observer. However software issues were preventing the finalisation and export of this video. To overcome this issue the SOT Coordinator had filmed the project using the editor software on his smartphone and put a copy it in a non-public You Tube repository at <https://www.youtube.com/watch?v=FVydywxlt7k> to give the TT an idea of the proposed content. It was recognized that I voice over's, subtitles , maps etc would still need to be added. The SOT Coordinator was requested to liaise with, and keep the TT-VRPP informed, regarding any further developments (**Action SOT Coordinator**).

The TT agreed that such videos were needed in order to

- a. Promote and explain how TurboWin should be used
- b. Train officers in how to make observations correctly
- c. Promote participation in the VOS Scheme

The TT also noted that a few years ago NOAA had produced a video which, whilst a bit dated, was nevertheless still relevant. The video was also available in digital format.

It was noted that NOAA intended to produce another digital video very much like the original. It was further noted that NOAA were currently gathering of sea state clips to assist in observations. It is intended that these clips will reside on the US VOS website as well as some of the US forecast office sites. NOAA were requested to keep The TT advised of any future developments concerning the video and sea state clips (**Action NOAA/TT Training Chair**)

The TT recognized the potential for developing short training clips (such as those for identifying sea state) that could be included in the help section of TurboWin program

(provided their size can be compressed). For those ships that can access the internet it was considered that web links could also be included with TurboWeb. Members of the TT were invited to submit potential material and KNMI were invited to consider the feasibility of bundling such training videos within TurboWin (**Action KNMI & VRPP Task Team**)

The TT also recognized the potential value of using such videos when visiting nautical colleges, not only as a means to promote the VOS but also as a tool to help train future observers. Because training is likely to be at the core of this work the TT recommended that video developments needed to be addressed jointly addressed by the VRPP and training Task Teams after the next session.

PMO Workshops& Forums

The team recalled that the last international PMO Workshop (PMO-IV, 8-10 Dec 2010) had been great success and looked forward to the next workshop to be held in Chile (PMO-V, 20-24 July 2015) which would provide a good opportunity to further promote and expand the VOS Scheme within South America

[Note – this initiatives will be addressed separately by the Task Team on Training]

Secondments

In terms of knowledge transfer it was recalled that at PMO-IV the idea of PMO exchanges was mooted whereby PMOs would send a short time shadowing a PMO in another country to learn how they do the job, and with a view to developing a best practices approach to ship inspection work. This would help to promote good practice whilst also helping to enhance PMO cooperation and knowledge. It was considered that this issue should be referred to the TT on Training to progress (**Action TT Training**)

Industry Forums

The TT recalled that at the last session the Team was invited to consider the value of arranging a shipping industry forum to be held in conjunction with the next SOT-8 session to help keep VOS shipowners and managers to keep them abreast of VOS developments (including moves to automate the VOS), and to encourage participation at the major shipping company level. Unfortunately this was possible for logistic, finance and resource implications.

Nautical Colleges

In a similar vein it was recognised that there was considerable merit in promoting the VOS Scheme to Nautical Colleges. This would help to engender a culture of weather observing to navigating cadets and to serving navigation officers studying for their certificates of competency. It was considered however that this issue should be progressed within the new TT on Training (**Action TT Training**)

Other Promotional Developments & Opportunities

The US drew the Task Team's attention to the promotional value that could be afforded by the forthcoming voyage of the replica of Lafayette's Hermione due to start in April (<http://www.hermione2015.com/>). They will be using TurboWin during the voyage, will be deploying drifting buoys, and will have professional film crew on board. Paula Rychtar (US) undertook to investigate whether they would also be willing to also provide some video clips to promote our VOS activities onboard (**Action US- Ms Paula Rychtar**)

		<p>It was noted the New York PMO was sending out “tips of the week” to help promote good observing practice among VOS observers</p>
<p>5</p>	<p>Promote the use of, and keep under review, the promotional ‘SOT Recruitment Presentation’</p>	<p>The TT noted that no substantive material to update the presentation had been provided intersessionally to the SOT Chair in order to update the SOT Recruitment presentation. As a consequence no changes had been made to the presentation since SOT-7</p> <p>The TT recalled that whilst the main SOT recruitment presentation is accessible on the VOS website at http://www.bom.gov.au/jcomm/vos/information.html, and that this link also provided access to separate short presentations on the VOS, ASAP, SOOP, Argo and DBCP.</p> <p>The SOT Coordinator advised that JCOMMOPS had resumed the production of monthly and yearly SOT maps (GTS-based) and that the set of maps available was growing. Moreover they provided views on the VOS scheme from different perspectives, such as recruiting country, automisation, masks, observing practices, parameter or region. At the last session it was agreed that such maps should be included in the presentation. The SOT Coordinator was therefore requested to further review the content of the presentation and include such maps where appropriate (Action SOT Coordinator)</p> <p>Although the promotional value of the presentation was appreciated, it remained unclear to the TT to what extent it was actually being used by SOT members</p>
<p>6</p>	<p>Establish a store of newsworthy articles for use in a SOT or VOS publications or in national newsletters.</p>	<p>The Task Team recalled its view that the VOS website should be the main access point and VOS related articles and recalled the action (assigned to the SOT Chair) that a link should therefore be made to the articles maintained on the E-SURFMAR Wiki Website at http://esurfmar.meteo.fr/wikisurf/index.php/Marine_Observing_Articles_Summary</p> <p>However because the E-SURFMAR website is password protected a link to these articles was considered inappropriate.</p> <p>It was noted the VOS website, which already includes several articles (at http://www.bom.gov.au/jcomm/vos/information.html#info05) would in the near future be transferred to JCOMMOPS. It was agreed that this website should in future become the main repository for articles related to VOS activities (and for that matter related to other SOT programs).</p> <p>It was recalled that VOS Focal Points and PMOs were encouraged at the last session to submit suitable newsworthy articles for inclusion on, or to be linked to, the VOS website. In addition PMOs were encouraged to make suitable copies available to their VOS, either electronically or by downloaded hardcopy.</p> <p>National VOS Operators were in future encouraged to provide the SOT Coordinator with suitable newsworthy articles or scientific papers related to VOS activities that could be included (or linked to) on the JCOMMOPS/VOS website (Action SOT Coordinator & VOS/SOT Focal points & PMOS)</p> <p><u>Mariners Weather Log</u></p> <p>The MWL is now one of the few remaining publications aimed at voluntary marine observers. Because it is widely read internationally it is very good medium for</p>

		<p>promoting the VOS Scheme</p> <p>It was noted that the MWL was available in two formats- a higher resolution PDF format suitable for printing and an HTML format for online ease in reading and for linking to videos, etc. In due course it is intended to change the HTML format to mimic the PDF format</p> <p>Following on from decisions taken at the last session the MWL is being increasingly promoted as an international publication, and input from international VOS operating countries is now actively encouraged. This can take the form of informative articles, operationally significant events, interesting marine photos etc. SOT members, VOS operators and PMOs were again encouraged to submit articles for inclusion in the MWL (Action VOS/SOT Focal Points & PMOs)</p>
<p>7</p>	<p>Develop a new survey/questionnaire directed at the VOS observers and shipowners with a view to assessing the performance of VOS Scheme and identifying issues that need to be addressed by the SOT. Review proposed content of the 2013 Marine Meteorological Monitoring Survey, and propose amendments as necessary</p>	<p>It was recalled that the MMM survey primarily focused on GMDSS and MSI issues and that only one section, concerning problems in contacting Inmarsat LES, related to VOS activities. The survey is now issued every other year, and copy of the latest 2013 online version is available at ;</p> <p>http://www.jcomm.info/index.php?option=com_content&view=article&id=315:marine-meteorological-monitoring-survey-2013&catid=7:services</p> <p>However the results of this latest MMM survey are not yet available for consideration by the Task Team</p> <p>In accordance with the action placed on it at SOT-7 the VRPP Chair, with input from the Task Team, has drafted a new survey/questionnaire directed at the VOS observers. The aim is to assess the performance of VOS Scheme and to identify any issues that need to be addressed by the SOT. A copy of the latest draft is at Annex F.</p> <p>As most VOS still do not have routine internet access the Task Team noted that Port Met Officers should have an important role to play in ensuring that the finalised questionnaire is widely distributed (in pdf or hardcopy format) to observing ships.</p> <p>The Team is invited to approve the VOS Scheme Questionnaire 2015 and agree that it should be issued to as many participating VOS as possible in order to assess the performance of the Scheme and to help determine how satisfied observers are in the way it operates and the service they receive from PMOs.</p> <p>The TT considered that questionnaire should run for six months but should be issued by the end of May in order that some preliminary results could be available for the PMO V international Workshop (Action VOS Operators, WMO Secretariat, PMOs VOS Chair)</p> <p>The WMO Secretariat is requested to investigate the potential for additionally issuing this questionnaire as an online survey via the JCOMM website (Action WMO Secretariat)</p> <p>The SOT Coordinator was requested to make any final editorial amends to the Questionnaire , taking into account any additional comments raised at SOT-8, and to</p>

		<p>arrange in liaison with the WMO Secretariat for a final pdf version to be sent to all PMO for distribution to participating ships(Action SOT Coordinator & WMO Secretariat)</p>
<p>8</p>	<p>Review all relevant JCOMM Publications to ensure they are up to date (in particular with respect to the new VOS classes) and comply with Quality Management terminology.</p>	<p><u>VOS Framework Document</u> It was recalled that the last major update to the VOS Framework document WMO/TD No 1009, JCOMM Tech report No.4 -2010 Rev 2 was undertaken in July 2010</p> <p>More recently the SOT Chair has reviewed the VOS Framework document and made further minor amendments to bring its content up to date. These amendments include, inter alia, the inclusion of an updated monthly map of VOS observations and changes to the table of VOS fleet figures. The WMO Secretariat was requested to provide update VOS fleet numbers to include in the revised document (Action WOM Secretariat). A copy of the latest draft of the Framework Document is at Annex G</p> <p><u>Other JCOMM/WMO Publications</u> The Task Team considered that WMO Pub 471, which was revised in July 2009 to reflect the new VOS classes, didn't need further revision right at this time.</p> <p>It remained for links to the following WMO Publications which are of relevance to VOS related activities to be included on the VOS Website</p> <ul style="list-style-type: none"> • WMO No. 8, (Guide to Meteorological Instruments and Methods of Observations - CIMO Guide- Chapter 4) http://www.wmo.int/pages/prog/www/IMOP/CIMO-Guide.html • WMO-558 (Manual on Marine Meteorological Services) http://library.wmo.int/pmb_ged/wmo_558_en-v1.pdf • WMO-471(Guide to Marine Meteorological Services 0 http://www.jcomm.info/components/com_oa/oa.php?task=download&id=15970&version=3rd%20Edition,%202001&lang=1&format=1), • WMO-8 (WMO Guide to Meteorological instruments and Methods of Observation) http://www.wmo.int/pages/prog/www/IMOP/CIMO-Guide.html. and • WMO Publication no 306 (http://www.wmo.int/pages/prog/www/WMOCodes/Manual/WMO306_Vol-1-1-PartA.pdf and http://www.wmo.int/pages/prog/www/WMOCodes/WMO306_v12/Volumel.2.html) <p>The SOT Coordinator was requested to include such links on the VOS Website (Action SOT Coordinator)</p>
<p>9</p>	<p>Promote the VOS Ancillary class and report on its implementation at SOT-8</p>	<p>As this was a substantive item the TT-VRPP Chair prepared a separate paper on this item (under Agenda item 7.8) with considerable input from the Task Team members.</p>

3) Recommendations of the Task Team to SOT-8

- (i) That a summary paper and supporting documentation should be prepared immediately after SOT-8 for submission to the ICS Marine Committee
- (ii) That the VOS Scheme Questionnaire 2015 should be issued to as many participating VOS as possible in order to assess the performance of the Scheme and to identify any areas where improvements may be needed
- (iii) That the VOS Brochure and VOS Poster should be approved for use (subject to final minor editorial by the SOT Coordinator)
- (iv) That a social network group should be set up as an alternative to the Wikilog, which should then be archived.
- (v) That the potential for using video for promoting both the VOS and for training VOS Observers should be addressed jointly addressed by the VRPP and Training Task Teams after the next session, and that their ToR should be amended as necessary
- (vi) That the following changes be made to the Task Team membership:

Remove: Graeme Ball (Australia)

Add: Joel Cabrié (Australia)

and

Amend membership to show Paula Rychtar (United States) as the VOSclim Focal Point

Summary of Status of Actions assigned to the Task Team at SOT-7

- (i) The Chair of the Task Team to liaise with the ETMSS Secretariat and keep the Task Team informed of relevant developments concerning the 2013 MMM Survey (**action; TT-VRPP Chair and WMO/ETMSS Secretariat; SOT-8**);

Ongoing - Findings of the 2013 MMM survey are still awaited . Copies of the 2013 survey available at http://www.jcomm.info/index.php?option=com_content&view=article&id=315:marine-meteorological-monitoring-survey-2013&catid=7:services

- (ii) The Task Team to draft a new survey/questionnaire directed at the VOS observers and shipowners with a view to assessing the performance of VOS Scheme (**action; TT- VRPP Chair; SOT-8**);

Done - New Survey/Questionnaire has been drafted for approval at SOT -8.

- (iii) The SOT Chair to include a link to the E-SURFMAR articles on the VOS website (**action; SOT Chair; asap**);

Not Done - Because the E-SURFMAR website is password protected a link was considered inappropriate .

- (iv) The US VOS Focal Point to consider the potential for widening the scope of the Mariners Weather Log to encompass international VOS activities (**action; US Focal Point; SOT-8**);

Done/Ongoing – MWL now being promoted as an international publication

- (v) VOS Focal Points and PMOs are encouraged to submit suitable newsworthy articles, and PMOs are encouraged to make suitable copies available to visiting VOS (**action; VOS Focal Points; ongoing**);

Ongoing – Articles for MWL being encouraged. Pdf version available for printing

- (vi) SOT TC to provide the SOT Chair with updated JCOMMOPS global network maps for inclusion in the SOT recruitment presentations (**action; SOT TC; asap**);

Part Done – new monthly and yearly SOT maps (GTS-based) are now available, but not yet included in presentation

- (vii) The SOT Chair to update the SOT recruitment presentation on the VOS website when a list of the required changes is available. (**action; SOT Chair; asap**);

Not Done –list of changes was not provided

- (viii) Task Team Members to propose amendments to the SOT recruitment presentation and to supply suitable new digital images for inclusion in the presentation. (**action; TT –VRPP members; asap**);

Not Done –no material provided (although images from VOS Brochure could be used)

- (ix) SOT TC to undertake the final editorial review of the VOS Brochure in liaison with the Task Team (**action; SOT TC; end 2013**);

Done/In hand – TT have reviewed final draft and final version will be available for distribution shortly after SOT-8

- (x) The Chair of the Task Team to circulate the final revised brochure to the PMO, VOS and SOT mailing lists (in pdf format) and to KNMI with a view to inclusion in the TurboWin program and AMVERSEAS. (**action; TT –VRPP Chair; Jan 2014**);

In hand – revised brochure developed and text almost finalised. For final approval at SOT-8

- (xi) The WMO Secretariat and SOT Chair to consider whether funding could be made available to publish hardcopies of the VOS Brochure (**action; WMO Secretariat & SOT Chair; end 2013**);

It is understood that WMO funding will not be available at the current time.

- (xii) E-SURFMAR to investigate the possibility of recording the issue of SOT Certificates in the E-SURFMAR database (**action; E-SURFMAR; end 2013**);

Done – this facility is now added under an icon after searching for a particular ship. Action can be closed

- (xiii) VRPP Chair and SOT Chair to review the content of the Quick Reference Guides and to send copies of the revised text to the Task Team for approval (**action VRPP Chair and SOT Chair; end 2013**);

Done - In general the VPPP and SOT Chairs felt that the content of the guides remained valid. However the TT will need to keep the content under review to accommodate recent developments

- (xiv) VRPP Chair to prepare an initial draft of a VOS Poster for circulation to the Task Team (**action; VRPP Chair; end 2013**);

Done – VRPP Chair made an initial draft for consideration by the TT and with a view to approval at SOT 8. Copies could be made available via the JCOMMOPS and VOS websites in due course

- (xv) Task Team to investigate the potential of using social media sites to promote the VOS with a view to making future recommendations to SOT (**action; VRPP Task Team; SOT-8**);

Done – proposals for developing/using social media sites included in this paper for SOT consideration

- (xvi) Task Team to investigate the potential for using video for promoting the VOS and for training observers (**action; VRPP Task Team; SOT-8**);

Done – proposals for using video included in this paper for SOT consideration

- (xvii) The Team requested the Task Team to assist on how to progress the Generic Design Recommendations in the light of recent developments e.g. discussions with ICS and WOC initiatives (see agenda item 5.2.5) (**action; TT-VRPP & WMO Secretariat; SOT-7**);

Ongoing – recommendations for progressing this matter are included in this paper for SOT consideration

- (xviii) SCOR to keep the Task Team informed of any discussions they might have with ICS or the marine industries that impact on the design requirements (**action; SCOR; SOT-8**);

Ongoing – the Task Team are not aware of any recent discussions

- (xix) ICOADS, in liaison with the VOSclim DAC, to make the delayed mode VOSclim data and call sign fully available in ICOADS. (**action; DAC and ICOADS; asap**);

Ongoing –The VOSCLim DAC is assisting ICOADS by providing delayed-mode observations, from the GCCs, with REAL call signs to, where possible, replace reports in the ICOADS data base originally transmitted over the GTS with masked call signs.

- (xx) WMO Secretariat to forward the approved VOSCLim certificate to the SOT Chair for posting on the VOS website and subsequent advice to the SOT, PMO and VOS mailing lists (**action; WMO Secretariat; asap**);

Done – new version now available on VOS website

- (xxi) The VOSCLim DAC to review the content of the DAC website in view of decisions taken by the Task Team (**action; VOSCLim DAC; end 2013**);

Done – The VOSCLim DAC website has been updated to reflect decision to use the E-SURFMAR metadata database as the main VOSCLim ship list

- (xxii) SOT TC to remove the VOSCLim mailing list from the JCOMMOPS website (**action; SOT TC; asap**);

Done – mailing list discontinued

- (xxiii) SOT Chair to undertake minor revision to the VOS Framework Document so that it includes links to latest JCOMMOPS global maps and information on VOS numbers (**action; SOT Chair; end 2013**);

Done – Minor revisions made and revised version available

- (xxiv) SOT Chair to add links to the WMO Publications listed in this report to the VOS Website (**action: SOT Chair; end 2013**);

Not Yet Done

- (xxv) DAC to remove the project Ship List from the DAC website (**action; DAC; April 2014**);

Done – ship list removed and link made to the E-SURFMAR metadata database

- (xxvi) VRPP Chair to send email to PMO and VOS mailing lists to advise that in future any changes to their VOSCLim fleets should be made to their WMO Pub 47 lists (by submission to WMO or by updating E-SURFMAR Metadata database). VOSCLim Ship operators to continue to separately notify the DAC of such changes until April 2014 (**action; VRPP Chair; Apr. 2014**);

Done – PMO/VOS mailing lists advised (by VOSCLim DAC)

- (xxvii) The Team concurred on the need to convene another international PMO Workshop and requested the Secretariat and the SOT Chair investigate feasibility and possibly to take steps for organizing the Fifth PMO workshop in Chile in 2014 (**action; WMO Secretariat & SOT Chair; SOT-8**). In light of the likely limited financial resources to be made available by the Secretariat in support of the event, the Team further requested its members to take steps to assure that financial assistance for the participation of their PMOs at the workshop will be provided from national sources (**action; SOT members; 2014**);

Done/In hand – PMO V will be held in Chile in July 2015

- (xxviii) The Team agreed that there was value of arranging a shipping industry forum to be held in conjunction with the next SOT-8 session, and requested the Secretariat in liaison with the

SOT Chair to investigate feasibility and possibly proceed in this regard (**action; SOT Chair & Secretariat; SOT-8**);

Not Done - Need for such a forum will need further consideration

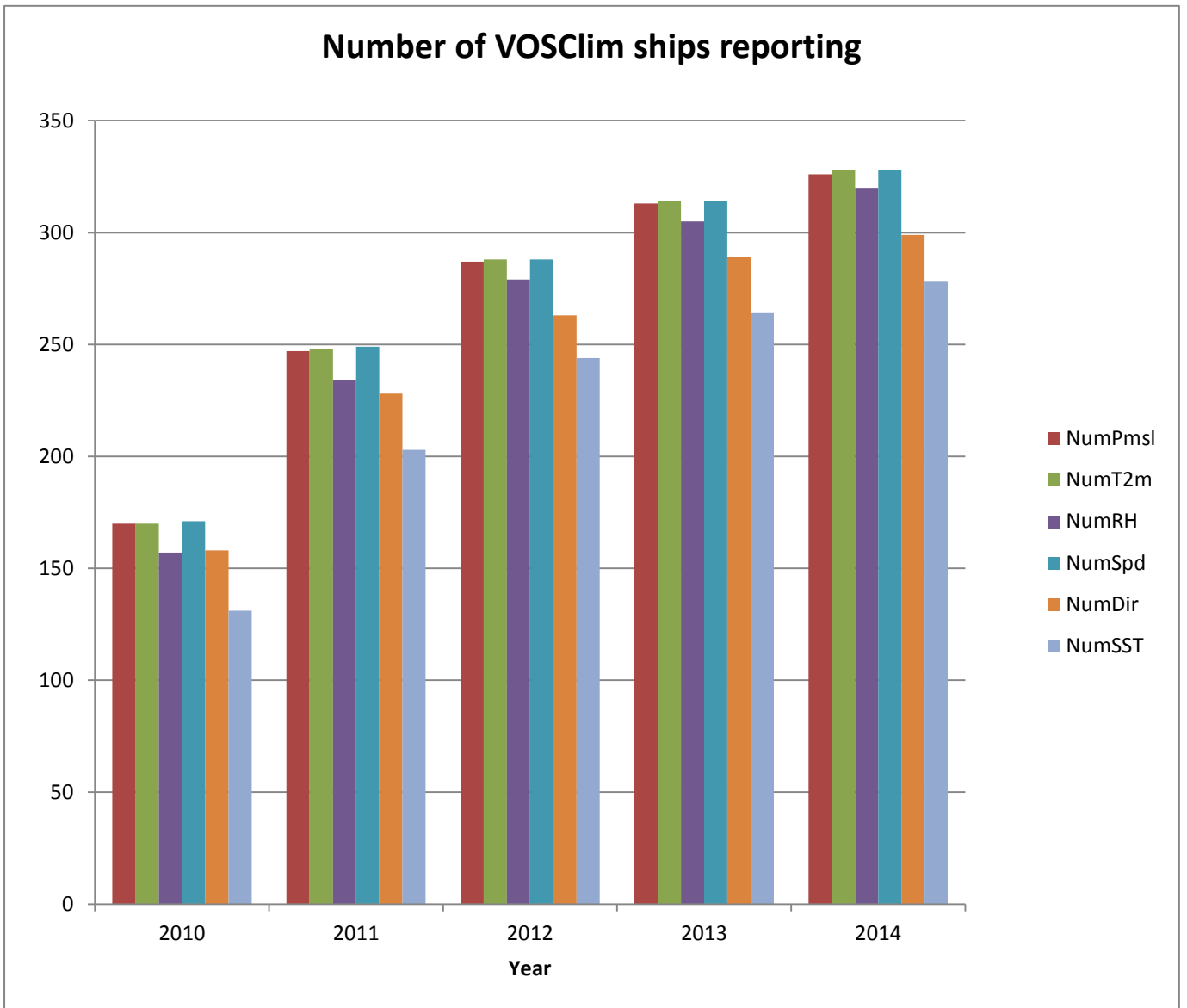
- (xxix) Mr Shawn Smith offered to present a poster at the next Oceanscience meeting in 2014 (**action; S. Smith; 2014**).

Done – ???

ANNEX A (OF APPENDIX C)

Number of VOSclim ships reporting each of 6 variables at least 5 times per month
(averaged over 12 month periods)

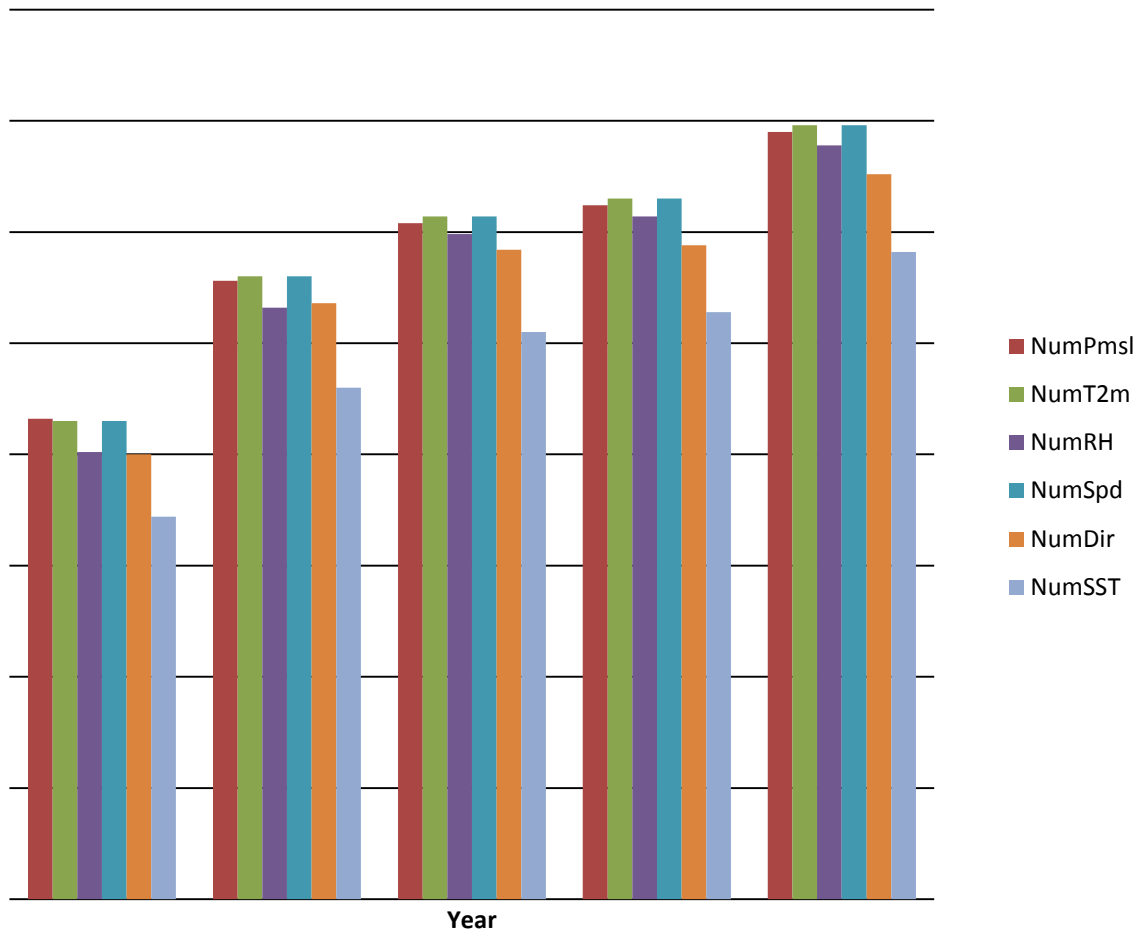
Year	NumPmsl	NumT2m	NumRH	NumSpd	NumDir	NumSST
2010	170	170	157	171	158	131
2011	247	248	234	249	228	203
2012	287	288	279	288	263	244
2013	313	314	305	314	289	264
2014	326	328	320	328	299	278



Number of VOSCLim ships reporting each of 6 variables at least 5 times per month (month of December each year)

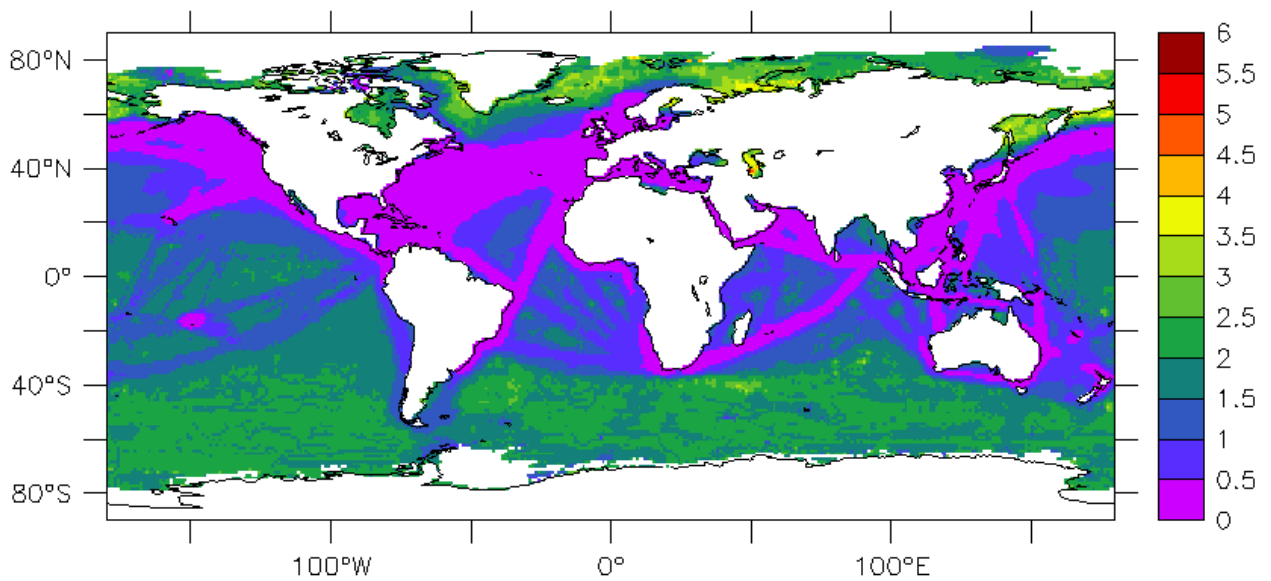
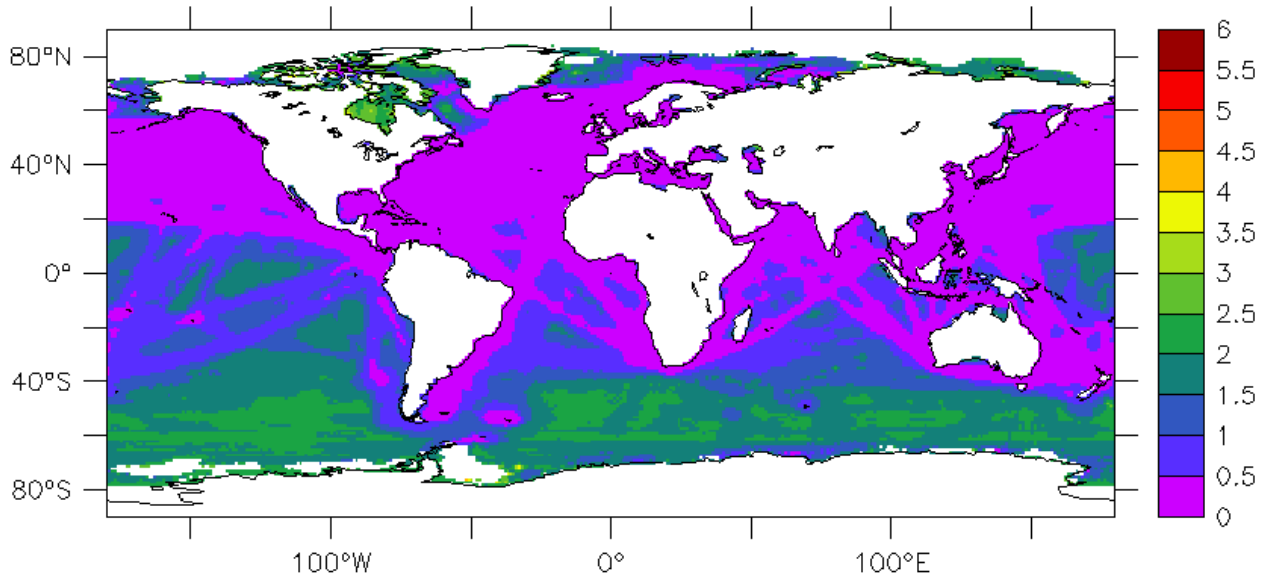
Year	NumPmsl	NumT2m	NumRH	NumSpd	NumDir	NumSST
2010	216	215	201	215	200	172
2011	278	280	266	280	268	230
2012	304	307	299	307	292	255
2013	312	315	307	315	294	264
2014	345	348	339	348	326	291

Number of VOSCLim ships reporting in December



ANNEX B (OF APPENDIX C)

**Maps showing the uncertainty in the monthly mean air temperature (°C)
from the VOS for 1988 (top) and 2014 (bottom)**



ANNEX C (OF APPENDIX C)

Proposed Generic Design Recommendations for Voluntary Observing Ships (VOS), Ships of Opportunity (SOOP) and Automated Shipboard Aerological Programme (ASAP) ships

Submitted by WMO & IOC Secretariats

1. Weather observations submitted by ships recruited into the World Meteorological Organisation's Voluntary Observing Ship (VOS) Scheme¹⁰ are essential for the provision of quality marine weather forecasts and warnings, and also provide vital data for use in climate research and climate prediction studies
2. The importance of such observations for the safety of navigation is recognised in Regulation 5 of Chapter V of the SOLAS Convention which states that '*Contracting Governments undertake to encourage the collection of meteorological data by ships at sea and to arrange for their examination, dissemination and exchange in the manner most suitable for the purpose of aiding navigation*'
3. Unfortunately, the number of VOS being recruited worldwide has decreased in recent years and this has inevitably had a consequential effect on the number, and quality, of observations being received from observing ships. This is due, at least in part, to the changing dynamic of modern ship operations, with reduced manning levels, and sudden changes of vessel ownership, flag and trading patterns.
4. To some extent, this decline in observations can be overcome by the use of Automatic Weather Stations (AWS) installed on suitable host ships. However, whilst the number of such AWS ships has increased in recent years they only provide a limited number of measured and observed parameters, and should only be considered as supplementing the traditional manually reporting VOS (where ships' officers provide additional visual observations of clouds, weather conditions, and sea states).
5. When recruiting existing ships to the VOS Scheme, problems are often experienced by meteorological and oceanographic services when trying to install, and locate instruments to ensure that they have the correct exposure, or when trying to install cables and meteorological/oceanographic sensors for automatic systems.
6. Such problems could be largely avoided if meteorological and oceanographic observing considerations could be taken into account at the ships initial commissioning and new-build design stage. In the overwhelming majority of cases only minor design adjustments are likely to be needed, and should therefore have no appreciable impact on overall ship costs.
7. With a view to reducing the impact of such downstream problems the JCOMM 11 Ship Observations Team has prepared initial draft generic recommendations that are considered appropriate for new ships intending to perform meteorological or oceanographic observations. A copy of these draft recommendations is annexed to this paper (*Annex*). These recommendations have been categorised according to the type of meteorological or oceanographic observations that the host ship is recruited by the meteorological services to perform. They range from simply making provision for suitable space in the wheelhouse for positioning meteorological instruments, to providing extra cabling capacity for remotely sensed sea temperatures, or gyro output connections to provide compass data to anemometers.
8. Because the observing scheme is entirely voluntary there should be no necessity to mandate the requirement for new ships to be designed for meteorological and or oceanographic observing by

¹⁰ <http://www.bom.gov.au/jcomm/vos/>

¹¹ *Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology* (<http://www.jcomm.info/>)

introducing amendments to the SOLAS Convention. Clearly the meteorological services rely on the continued support of shipping companies and their officers and masters for the success of the VOS Scheme – and it is pleasing to note that many ship owners now pro-actively request their newly delivered ships to be recruited, as they recognise the merits of the VOS scheme

9. However, it would be helpful if, at the initial design stage, ship owners could, if they so wish, request that their vessels be designed and constructed to allow their future recruitment to perform meteorological and or oceanographic observations

10. Most ships that agree to participate in the VOS scheme are provided with calibrated instruments by the national meteorological service that has recruited them, and transmit a full range of observed parameters. These are referred to as ‘Selected’ observing ships, including VOSclim ships. However, in some cases, ships may be recruited by the national meteorological service to use their own ships instruments and to transmit a limited number of observed parameters. These ships are referred to as ‘Auxiliary’ observing ships and are often recruited because they operate in areas where data is in sparse supply

11. Many new ships are already being equipped by the ship owners themselves with modern weather observing equipment such as sonic anemometers, and in some cases automatic weather stations. Subject to the suitability of the instruments, being provided, such ships would lend themselves to recruitment as ‘Auxiliary’ observing ships. Development of specifications based on those annexed herewith, could therefore also be of assistance to ship owners and shipbuilders when determining the suitability of the ships meteorological arrangements. For instance, it is essential that ships anemometers be correctly exposed, ideally on the foremast, so that wind effects caused by the ship superstructure or other adjacent structures do not adversely affect them. Similarly, the quality of measurement using dry and wet bulb thermometers in a marine screen will diminish if the screen is not properly exposed e.g. if it is positioned under a ship’s overhang or adjacent to ship’s vents

12. In addition to their value to the meteorological and oceanographic communities, observations from ships at sea clearly have an important role to play in ensuring the ongoing safety of ships, their crews and their cargoes. The data provided by observing ships are needed for a variety of marine activities including having to deal with incidents such as search and rescue, marine pollution and safe weather routing of ships. The VOS Scheme therefore needs active support from the marine community, and particularly, support and assistance from ship owners, if we are going to reverse the current decline in ships weather data.

13. The Maritime Safety Committee is invited to consider the issues raised in this paper and to advise on the most appropriate way to proceed, e.g. referring this subject to the work programme of the Ship Design and Equipment Sub Committee to develop appropriate specifications that could then be issued as guidance to ship owners, or be used as the basis for reviewing classification requirements.

Annex of Annex C (of Appendix C)

Generic Design Recommendations for Voluntary Observing Ships (VOS), Ships of Opportunity (SOOP) and Automated Shipboard Aerological Programme (ASAP) ships

The following recommendations provide a basic guide to ship owners, ship builders and classification societies concerning the design and construction arrangements that should be taken into account for new ships that will be engaged in undertaking meteorological and or oceanographic observations.

Ship owners are encouraged to liaise with the national meteorological services concerning the level of observational activity they wish their vessels to become involved in, so these can be taken into account in the initial ship build specifications and design.

Voluntary Observing Ships (VOS)

1. Selected Voluntary Observing Ship (VOS) and VOSCLim - Basic

'Selected' and 'VOSCLim' ships recruited to participate in the VOS scheme are provided with range-calibrated instruments by the national meteorological services and transmit a full range of observed meteorological parameters. The following basic design requirements are therefore recommended to facilitate the installation of such instruments and to allow ships' officers to prepare their observations in a suitable environment that does not hamper other activities performed within the ships wheelhouse:

- A dedicated locker within the wheelhouse for storing spare meteorological equipment spares and stationery [dimensions approx 0.6m x 0.6m x 0.6m]
- A non-slip work surface for locating meteorological instruments supplied by the Meteorological Services (e.g. barograph, barometer, electronic logbooks) [dimensions approx 0.6m x 0.6m] with free area above for fixing instruments to bulkhead.
- A dedicated adjacent power socket to the ship's power supply (for use in connection with electronic logbooks or other digital observing instruments that require a power supply)
- Ability to pre-load electronic logbook software on to one of the ships bridge computers that is connected to the ships email system for transmitting observations to the national meteorological service, or which provides easy access for transferring the observations to the ships Inmarsat C equipment

2. Selected Voluntary Observing Ship (VOS) and VOSCLim – Advanced

In addition to the basic provisions listed in para 1, 'Selected' and 'VOSCLim' ships recruited to participate in the VOS scheme may have additional requirements that need to be taken into account, subject to the level of instrumentation being provided by the national meteorological service involved. These may include some or all of the following recommendations, which will need to be agreed with the national meteorological service involved:

- For ships provided by meteorological services with marine screens, containing dry and wet bulb thermometry of sensors - Two slotted vertical stanchions [approx 1m length] on the aft port and starboard bridge wings. To be located in a suitably exposed location and positioned so that screens can be fixed at a height above ships rails of [approx 1.6 m], but such that their position will not impair the taking of azimuth compass readings by navigating officers, or interfere with any other of the ships normal functions or requirements. For ships without bridge wings provision should be made for securing screens in alternative locations that are easily

accessible from the ships bridge, but which are not, in so far as is reasonable and practicable, located under superstructure overhangs or adjacent to heat sources such as searchlights or ships vents.

- For ships provided by the meteorological service with a precision aneroid barometer located within a pressurised wheelhouse - a dedicated bulkhead penetration from the wheelhouse to the exterior atmosphere for leading a pressure static head tube [Dimensions approx 15mm].
- For ships provided by the meteorological service with electrical resistance thermometers or electrical humidity sensors - a bulkhead penetration to permit cables to be run from a digital indicator at the meteorological work surface in the wheelhouse (para 1 refers) to the marine screens located on either bridge wing [Dimensions approx 15mm]
- For ships provided by the meteorological service with hull contact sensors for measuring sea surface temperatures – a cable run from the digital indicator at the meteorological work surface in the wheelhouse (para 1 refers) to the hull contact sensor located in the engine room, or suitable void space, at a distance of [approx 1 metre] below the light waterline. Existing cable runs from the bridge to the engine control room, bus connector may be utilised if spare capacity is available. Wireless connectivity has been successfully deployed by the Australian Bureau of Meteorology and cabling may no longer be considered a requirement but a cable run would be a backup option.
- For ships provided by the meteorological service with a dedicated anemometer for measuring wind speed and direction – a cable run and associated deck/hull penetrations from the meteorological work surface in the wheelhouse (para 1 refers) to the anemometer location on the foremast, mainmast or a dedicated meteorological mast, (as agreed with the meteorological services). To provide optimum exposure, free from obstructions, the preferred location for the anemometer will usually be on the foremast (i.e. for ships with aft accommodation superstructures).

3. Selected Voluntary Observing Ship (VOS) and VOSCLim – Autonomous Automatic Weather Station (AWS)

The Ships recruited to participate in the VOS scheme, which are provided by the meteorological service with simple, autonomous AWS systems, measuring a limited number of observed parameters e.g. pressure, temperature and humidity. Depending on the system provided the following arrangements be recommended for new build ships:

- For systems that rely on connection to the ships power supply – a dedicated power socket providing access to the ships power supply.
- For systems that incorporate a digital or visual readout unit on the bridge – a suitable installation location, or housing, on the ships bridge console or other suitable location within the wheelhouse or chartroom
- bulkhead or deck penetrations in the vicinity of the location chosen for the AWS installation for leading cabling, as necessary, to the wheelhouse power socket and/or digital readout
- A suitable location for securing the AWS to an adjacent handrail or bulwark together with a suitable securing bracket. AWS systems will often incorporate their own transmission systems, the installation position chosen should comply with specified electrical clearance distances to avoid interference both to and from other ship's antennae or electrical sources

4. Selected Voluntary Observing Ship (VOS) and VOSCLim – Integrated Automatic Weather Station (AWS)

The Ships recruited to participate in the VOS scheme which are provided, by the meteorological

service with integrated AWS systems, measuring a variety of meteorological parameters, including pressure, sea temperature, air temperature, humidity, wind speed and wind direction. Depending on the system provided by the meteorological service, the following additional arrangements may be needed for new build ships:

- When AWS sensors, transmission systems, and associated units are located on a dedicated small mast, the deck plating should be suitably strengthened. Deck securing points may also need to be provided to facilitate guy wires.
- When the meteorological sensors are distributed on the ships structure the following installation considerations should be taken into account
 - The position of transmission antennae should comply with specified electrical clearance distances to avoid interference both to and from other ship's antennae or electrical sources and should ideally be located on the mast in a position that will allow unobstructed line of sight to geostationary satellites.
 - The position of the anemometer should provide good exposure, free from any obstructions that may interfere with the airflow. The optimum location for the anemometer will usually be on the foremast (i.e. for ships with aft accommodation superstructures)
 - The position of the temperature/humidity screen should provide good exposure to allow unobstructed airflow and to avoid radiation heat sources. They are usually located on the ships monkey island fixed by brackets to an adjacent handrail or bulwark.
 - The hull contact sensor for measuring sea surface temperatures should normally be located on the ships hull plating in the ships engine room or a suitable void space, and positioned [approx 1 metre] below the waterline at the ships lightest operating draft, free from any adjacent heat sources in so far as is possible
- bulkhead or deck penetrations should be provided to allow cables to be led from the AWS unit or sensors to the central bridge computer, display and electronic junction boxes (when applicable) which would normally be located at the meteorological work surface in the wheelhouse (para 1 refers), and will need a dedicated electrical socket to provide access to the ship's power. Typical cable requirements include for example;
 - Wind Sensor - [8 core multi-strand shielded cable from wheelhouse to sensor location on the mast]
 - Gyro Compass - [2 core multi-strand shielded cable from wheelhouse to gyro room]
 - Sea temperature sensor - [4 core braid-shielded cable from wheelhouse to sensor location in engine room or void space]. Existing ships spare cable capacity to engine room may be useable
 - Transmission system - [dedicated cable dependant upon system used – Inmarsat, iridium etc – from wheelhouse to antennae location]
 - Pressure sensor (Barometer) - [4 core multi-strand shielded cable from sensor to wheelhouse (depending on location)]
 - [Data transfer logging cables – multi- strand shielded cable as required]
- Access to the ships gyrocompass or gyro-repeaters may be needed to provide directional values to the ships anemometer readings, although some AWS systems may incorporate built in magnetic or fluxgate compasses. Where connection to the gyro is needed it may be considered necessary to provide an optical isolator to ensure that there is no interference with navigational safety

5. Auxiliary Voluntary Observing Ship (VOS)

Auxiliary ships recruited by the meteorological service to the Voluntary Observing Ship (VOS) Scheme use their own ships' instruments to prepare and submit weather observations. To ensure

that new ships can be considered suitable for future recruitment to the VOS Scheme it is recommended that ship owners ensure that the instruments or automatic weather systems pre-installed, comply with the WMO and, where applicable, ISO standards.

Ships of Opportunity (SOOP)

Within the SOOP scheme, ships are recruited to perform oceanographic sampling, mainly through the deployment of eXpendable BathyThermographs (XBT), but other types of measurements are also carried out, such as sea surface salinity and temperature using Thermosalinographs (TSG), partial pressure of CO₂ (pCO₂) in surface sea water and ocean currents using Acoustic Doppler Current Profilers (ADCP). Depending on the measurement systems provided by SOOP operators, the following design considerations are recommended to improve installation and maintenance of instrumentation and to ensure effective and continuing operation within applicable quality requirements:

- bulkhead or deck penetrations should be provided to allow cables to be lead from the instrument location to the central bridge computer. If SOOP systems incorporate their own communications infrastructure, cable penetrations would be required from computer to transmission antennae. Optimal performance during transmission generally requires the shortest cable length, unobstructed line of sight and minimum RF interference from other devices. Antennae location should not interfere with normal operations of the vessel.
- A dedicated work area for locating instruments. TSG operations require pumped sea water usually available in the ship's engine or bow thruster rooms. XBT launch site locates preferably at the stern of the ship. In any case, easy access to instrumentation should be provided for maintenance and operation purposes.
- For TSG and pCO₂ systems, a water intake should be available as close as possible to the sea water to prevent biases due to warmer temperatures in the engine room.
- A dedicated desk or table to accommodate computer, cabling and other electronic equipment within the wheelhouse.
- A dedicated power socket providing access to the ships power supply within the wheelhouse and at the instrument's location.
- A dedicated locker within the wheelhouse to be used as storage for tools and spare parts. Deployment of XBT, drifters and Argo floats requires appropriate storage areas preferably in close proximity to the deployment location.

Automated Shipboard Aerological Programme (ASAP) ships

A small number of observing ships are recruited to provide upper air data from radiosonde balloons, and are provided by the meteorological services with equipment. These ships contribute to the ASAP programme. ASAP ships designs can be based upon a 'modular' configuration with all the ASAP systems housed within standard 10 or 20 foot shipping containers, or may use a 'distributed' configuration, where the ground station and associated transmission system can be located in the host ship's wheelhouse. Depending on the arrangements provided by the meteorological Service, the following considerations should be taken into account in the ships initial design:

- Sufficient free deck space should be allocated for a [10 or 20 foot] shipping container, or any manual deck launching devices that may be provided by the meteorological services. The locations chosen for these launching systems should not interfere with the ship's emergency embarkation arrangements, fire protection or safety arrangements, or with safe navigation of the ship.
- Where manual deck launchers are used there should be sufficient free space available to enable the launcher to be transferred to either side of the ship (to facilitate launching in lee wind conditions).

- The launching area should permit, as far as is possible, the radiosonde balloon to be launched such that it will not snag the funnel or ships superstructure during its ascent.
- Where containerised systems are used suitable deck securing points should be provided and the deck plating strengthened where needed.
- Access to the ships power supply should be available to the container.
- When they are not located in a dedicated container, a suitable locker or other suitable storage location should be provided for spare radiosondes and balloons. Storage dimensions should be sufficient for at least 3 months of sounding operations. Depending on the size of the packages the required total storage is about 0.75 m³.
- A suitable free deck space of at least 1.5 x 1.0 m² for securing the helium gas bottle racks, ideally located close to the launching area, but positioned so that replacement gas bottles/pallets can be easily loaded and positioned using the ships lifting appliances.
- Plastic or copper piping from the helium bottles to the launching container and/or deck launcher. The piping should not interfere with the ships working or safety arrangements.
- A suitable location high up in the ship (usually the monkey island) may be needed to install the dedicated aerial for receiving the raw data from the radiosonde. (This could be a directional mushroom aerial or a multi-directional dipole aerial). Lugs may need to be welded to the deck and a stand plate may be needed to secure the aerial pedestal. Anti vibration, mountings may be needed.
- A suitable location may also be needed for installing a dedicated satellite communication system for transmitting the upper air observations back to the meteorological services i.e. if the ships transmission system is not used.
- A suitable location for an independent GPS aerial for determining the relative position of the ship and radiosonde.
- bulkhead or deck penetrations should be provided to allow cables to be lead from the ASAP ground station computer when located in the wheelhouse to the required antennae.
- The position of ASAP transmission antennae should be located to avoid interference from other ships antennae or electrical sources and free of obstructions that could prevent them from receiving or transmitting signals e.g. masts, large funnels containers etc.

.....

In accommodating all the above recommendations ship owners, ship builders and naval architects should ensure that the arrangements are in accordance with, and do not conflict with, SOLAS requirements applicable to new vessels. In particular, it should be ensured that SOLAS fire class division requirements are observed and that the arrangements do not interfere with any navigational or life-saving requirements that may be applicable.

ANNEX D (OF APPENDIX C)

REVISED DRAFT OF THE VOS BROCHURE

The revised draft of the VOS brochure is available on the SOT-8 website at:

http://www.jcomm.info/index.php?option=com_oe&task=viewDocumentRecord&docID=14797

ANNEX E (OF APPENDIX C)

VOS POSTER

The draft VOS Poster is available on the SOT-8 website at:

http://www.jcomm.info/index.php?option=com_oe&task=viewDocumentRecord&docID=14799

ANNEX F (OF APPENDIX C)



Voluntary Observing Ship Scheme Questionnaire - 2015

In order to monitor and evaluate the effectiveness of the international VOS Scheme the JCOMM* Ship Observations Team (SOT) would greatly appreciate your cooperation in completing the following questionnaire. The questionnaire should be completed by Captains, officers and crew of ships recruited to the VOS Scheme and who are actively submitting weather observations to their recruiting National Meteorological Service. The questionnaire applies only to ships which are manually reporting, and not to ships equipped with Automatic Weather Stations.

* Joint WMO/IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM).

Note - For ships equipped with internet/web access, an online version of this survey form is also available at XXXXXXXXXX

Ship Name	
Call Sign	
IMO Number	
VOS Recruiting Country	
Name of Master [¥]	
Name of person completing this questionnaire [¥]	
Date questionnaire completed	

[¥] Non Mandatory

Please complete the questionnaire by placing a cross (x) under the appropriate column heading and providing additional information or comments as appropriate

	AGREE STONGLY	AGREE	NEITHER AGREE OR DISAGREE	DISAGREE	DISAGREE STRONGLY
Q1- I receive regular feedback on the quality of my real time observations from a visiting Port Meteorological Officer or from my recruiting national meteorological service.					

	Never	Monthly	Quarterly	6 Monthly	Annually
Q1 a - On average, how often do you receive feedback on the quality of your observations?					
	AGREE STRONGLY	AGREE	NEITHER AGREE OR DISAGREE	DISAGREE	DISAGREE STRONGLY
Q1b - I know who to contact in order to get feedback on the quality and timeliness of my weather observations, or on the accuracy of my meteorological instruments					

Comments:

<u>Training</u>	AGREE STRONGLY	AGREE	NEITHER AGREE OR DISAGREE	DISAGREE	DISAGREE STRONGLY
Q2a - My ship is regularly visited by a Port Meteorological Officer in the country that recruited our ship as VOS to check the calibration of our meteorological instruments and to provide training in the correct observational practices					
Q2b - My ship is regularly visited by a Port Meteorological Officer of a country that didn't recruit our ship as VOS to check the calibration of our meteorological instruments and to provide training in the correct observational practices					
	Never	Monthly	Quarterly	6 Monthly	Annually
Q2c - Overall, how often is your ship visited by a Port Meteorological Officer?					
	AGREE STRONGLY	AGREE	NEITHER AGREE OR DISAGREE	DISAGREE	DISAGREE STRONGLY
Q3 - I received sufficient training at a nautical college or other maritime institute to enable me to take weather observations.					
Q4 - I understand how to use the electronic logbook software (e.g. TurboWin) provided to my ship for compiling my weather reports					
Q4a - Which type of e-logbook software do you currently use? (e.g. TurboWin)					

Comments:

<u>Awareness</u>	AGREE STRONGLY	AGREE	NEITHER AGREE OR DISAGREE	DISAGREE	DISAGREE STRONGLY
Q5 - My observations provide a vital role in ensuring Safety of Life at Sea					
Q6 - My observations could be made just as well by meteorological satellites or environmental buoys.					
Q7 - My shipping manager/owner recognises the importance of weather observations and actively encourages participation in the VOS Scheme					
Q8 - My observations are shared internationally with all national meteorological services for the common good.					
Q9 - My weather observations need to be submitted in good time for use in forecast models					
	< 10 mins	< 30 mins	30 mins to 1 hour	> 1 hour	> 2 hours
Q9a - How soon after taking your weather observations do you send them ?					
	< 5 mins	< 10 mins	< 15 mins	< 20 mins	>20 mins
Q9b - On average how long does it take you to compile a weather observation?					

Comments:

<u>Instruments</u>	AGREE STRONGLY	AGREE	NEITHER AGREE OR DISAGREE	DISAGREE	DISAGREE STRONGLY
Q10- The meteorological instruments supplied to, or used on, my ship for weather observations are accurate					
Q11 - The meteorological instruments used for weather observing on my ship are returned for recalibration at the required intervals.					

Comments:

<u>Data Transmission</u>	AGREE STONGLY	AGREE	NEITHER AGREE OR DISAGREE	DISAGREE	DISAGREE STRONGLY
Q12 - I have no problems with transmitting my weather observations ashore.					

Q12a - Which method(s) do you most commonly use for sending your weather observations e.g. Inmarsat, email, web etc? (If more than one method, please list them in order from most used to least used).	
--	--

Comments:

<u>Satisfaction</u>	VERY POOR	POOR	AVERAGE	GOOD	VERY GOOD
Q13 -Overall how would you rate the VOS Scheme?					
	AGREE STONGLY	AGREE	NEITHER AGREE OR DISAGREE	DISAGREE	DISAGREE STRONGLY
Q13a - I am happy to be a part of the VOS Scheme					

Other issues or problems you wish to mention concerning the VOS Scheme , or suggestions you may have on how it might be improved

Use additional Sheets if necessary

After completion please return to the following address

**Marine Meteorology and Ocean Affairs
Division
World Meteorological Organisation
7 bis, avenue de la Paix
Case Postal No 2300
CH-1211 Geneva 2
Switzerland**

Or alternatively :

Provide the completed copy to a visiting
Port Meteorological Officer.

E-mail a scanned copy to **XXXXXXX**

ANNEX G (OF APPENDIX C)

The Voluntary Observing Ship Scheme, A Framework Document

The proposed draft revised version (REV-3) of JCOMM Technical Report No. 4, is available on the SOT-8 website at:

http://www.jcomm.info/index.php?option=com_oe&task=viewDocumentRecord&docID=14802

APPENDIX D

REPORT BY THE TASK TEAM ON METADATA FOR WMO PUBLICATION NO. 47
(report submitted by the Chair of the Task Team, Mr Graeme Ball – Australia)

1) Task Team members

- Graeme BALL (Australia)
- Sarah NORTH (United Kingdom)
- David BERRY (United Kingdom)
- Pierre BLOUCH (France)
- Lily FUNG (Canada)
- Elizabeth C. KENT (United Kingdom)
- Steven PRITCHETT (United States)

2) The Task Team addressed its Terms of Reference as detailed below.

ToR no.	Terms of Reference	Action(s) undertaken during the intersessional period
1	Regularly review the WMO Publication No. 47 (Pub47) metadata requirements and make recommendations as appropriate.	<p>Ongoing activity. The TT considered a range of modifications during the inter-sessional period:</p> <ul style="list-style-type: none"> - Use of codes 80 and 85 (AWS) in Code Table 2202 for the Ancillary Class, should the Pilot Project recommends the Pilot Project become a VOS Class. - New requirement to record metadata about instrument sampling rates, accuracies and precision. - Add a new code HH (Hand-held digital temperature/humidity sensor) in Code Table 0801. - Add new code ZZ to Code Table 1801 for JCOMMOPS recruited Ancillary ship. - New requirement to record the data format used to send data from ship-to-shore.
2	Monitor the receipt of regular Pub47 updates at WMO from participating VOS members.	<p>Ongoing activity. WMO receives regular updates from WMO Members. These are (i) automatically forwarded to E-SURFMAR and JCOMMOPS for inclusion in their respective databases, and (ii) included in the official version of Pub47 with some delay.</p>
3	Review all relevant JCOMM Publications to ensure they are up to date and comply with Quality Management terminology.	<p>Relevant JCOMM publications were maintained as required.</p> <p>Updates to the Pub47 XML Generator Tool on the VOS website:</p> <p>(1) 23 May 2013. Compliance with Pub47</p>

		version 04 specifications. (2) 1 April 2015. Compliance with the change of location of the Pub47 XML Schema namespace variable
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3) Recommendations of the Task Team to SOT-8

- (1) The Team to endorse the addition of Codes 80 and 85 (AWS) to Code Table 2202 (type of meteorological reporting ship) if the VOS Ancillary Pilot Project recommends that the Pilot Project be elevated to VOS Class status.
- (2) The Team to endorse adding code HH (hand-held digital temperature/humidity sensor) to Code Table 0801. The Team to endorse adding code ZZ (JCOMMOPS recruited Ancillary ship) to Code Table 1801.
- (3) As a result of the transfer of the VOS Website from ABOM to JCOMMOPS, the Team to endorse a change in the location of the Pub47 XML Schema namespace variable.
- (4) The Secretariat to again remind VOS Focal Points and VOS program Managers not using the E-SURFMAR VOS Metadata Database operationally, to submit their national Pub47 metadata to WMO at least quarterly (by January 15, April 15, July 15 and October 15) or preferably each month.
- (5) The Team to approve a change to the membership of the Task Team to:

Remove: Graeme Ball (Australia)

Add: Joel Cabrie (Australia).
- (6) The Team to appoint a new Chair of the Task Team.

ANNEX OF APPENDIX D

DRAFT REVISED VERSION OF THE WMO-NO. 47 METADATA FORMAT.

Draft revision no. 4.2 of the Metadata Format Version 04 (metadata fields & descriptions, exchange formats and code tables) of WMO-No. 47 (International list of Voluntary Observing Ships) is available at the following website:

http://www.jcomm.info/index.php?option=com_oe&task=viewDocumentRecord&docID=14817

APPENDIX E

REPORT BY THE TASK TEAM ON INSTRUMENT STANDARDS

(report submitted by the interim Chairperson of the Task Team, Mr Henry Kleta – Germany)

1) Introduction

This report addresses the key issues assigned to the Team in its Terms of Reference and identifies the key areas where progress has been made since SOT-7.

The report invites the SOT to consider carefully how the project should develop in the future, so that it can help to raise the climate quality of data within VOS, and thereby contribute to the Global Climate Observing System (GCOS).

The following supporting documents are appended to this report

- Annex A:** Instrument Standards Guidelines
- Annex B:** Instrument Standards Equipment Status Report
- Annex C:** Status of actions agreed at SOT-7
- Annex D:** Additional information to Annex C

2) Task Team members

- Henry KLETA (Germany)
- Graeme BALL (Australia)
- David BERRY (United Kingdom)
- Francis BRINGAS (United States)
- Jean-Baptiste COHUET (France)
- Caridad Ibis GONZALEZ (United States)
- Elizabeth C. KENT (United Kingdom)
- Rudolf KROCKAUER (Germany)
- Martin MACLELLAN (Canada)
- Sarah NORTH (United Kingdom)
- Hiroshi OHNO (Japan)
- Shawn RICKARD (Canada)
- R. (René) ROZEBOOM (the Netherlands)
- Paula RYCHTAR (United States)
- Shawn SMITH (United States)
- Johan STANDER (South Africa)
- Scott WOODRUFF (United States)
- Association of Hydro-Meteorological Equipment Industry (HMEI) representative (Associated Member)

The Task Team also includes the following working groups:

- Working Group on Publications chaired by Henry Kleta (Germany);
- Working Group on Automatic Weather Stations chaired by Henry Kleta, and including Sarah North (UK), Shawn Smith (USA), Paula Rychtar (USA), and a representative of Canada (TBD) in its membership;
- Working on New Technology chaired by Shawn Smith (USA).

3) The Task Team Terms of Reference

ToR no.	Terms of Reference
1	Compile information on existing activities, procedures and practices within JCOMM relating to instrument testing, standardization and intercalibration, as well as the standardization of observation practices and procedures;
2	Using guidance contained in existing guides including the WMO Guides on Instruments and Methods of Observation (WMO-No.8) communicate with manufactures regarding new technologies and recognized equipment problems;
3	Prepare dedicated WebPages containing this information, to be made widely available through the JCOMM web site and linked from other relevant websites (JCOMMOPS, VOS, DBCP, SOOP, and SOT);
4	Provide guidance on testing and the intercalibration of marine meteorological and oceanographic observing systems;
5	Liaise closely with WMO/CIMO, both in the compilation of the information and in assessing what additional work in this area might be required under JCOMM;
6	Liaise closely with IOC in the preparation of the wider compilation of existing instrumentation and observing practices standards in oceanographic observations in general, with a view to inputting an appropriate contribution from JCOMM;
7	Perform intercomparisons as required by SOT Sessions;
8	Review all relevant JCOMM Publications to make sure they are kept up to date and comply with Quality Management terminology;
9	Work with the WMO Commission on Instruments and Methods of Observations for updating the WMO Guide No. 8 section dealing with ship-based observations.

3) Recommendations of the Task Team to SOT-8

The Task Team is inviting the SOT to consider the following actions:

1. Revise the Task Teams Terms of Reference, as necessary, to reflect the proposed changes to the project.
2. Consider the information contained in this report concerning the current status of the Instrument Standards Task Team (TT-IS).
3. Encourage members to contribute to the compilation of JCOMM TR 63 “Recommended Algorithms for the computation of marine meteorological variables” and follow the recommendations made in that TR.
4. The Team is encouraged to suggest additional variables to be added to the JCOMM TR 63 during the next intersessional period.
5. Consider the use of online questionnaires to collect information on Instrument Standard Guidelines (Appendix B) and Instrument Standard Equipment (Appendix C) and make them available to all potential users.
6. Terminate the working groups of the TT-IS (Working Group on Publications, Working Group on Automatic Weather Stations, Working Group on New Technology) as they have proven to be not practical. The TT-IS shall setup ad-hoc Working Groups instead when needed.

ANNEX A OF APPENDIX E
INSTRUMENT STANDARDS GUIDELINES

1. VOS
 - a. WMO
 1. Guide To Meteorological Instruments And Methods of Observation (WMO-No. 8)
 - a. 7th Edition (Aug 08) http://www.wmo.int/pages/prog/www/IMOP/publications/CIMO-Guide/CIMO_Guide-7th_Edition-2008.html
 - b. Approved changes from SOT-IV have been submitted to CIMO for endorsement and inclusion in next edition
 - b. NMS
 1. Australia
 - a. Port Meteorological Agents Guide
 - b. TurboWin User Guide
 - c. TurboWin Setup Manual
 2. Germany
 - a. Port Met Officers Work Instruction
 - b. Marine Observers Guide
 3. Hong Kong
 - a. Guidance Notes on Port Meteorological Services
 - b. Marine Observers Handbook
 - c. UK Met.O. 740
 4. Japan
 - a. Guide to Weather Observations for Ships (JMA)
 - b. Guide to Ships Weather Reports (JMA)
 - c. Manual on Port Meteorological Services (JMA, in Japanese)
 5. United Kingdom
 - a. Marine Observers Handbook
 - b. Port Met Officers Work Instruction
 - c. UK Met.O.740 (Only provided on request from ship)
 6. United States of America
 - a. Military Specification MIL-B-17089
 - b. National Weather Service NWS G101 – SP004
 - c. National Weather Service NWS G222 – SP002
 - d. NWS Instruction 10-201 (Feb 24, 2012)
<http://www.nws.noaa.gov/directives/sym/pd01002001curr.pdf>

2. SOOP

1) IOC

1. Guide to IGOSS (now JCOMM) Data Archives and Exchange (BATHY and TESAC) - IOC Manual and Guides No.1
2. Guide to Operational Procedures for the Collection and Exchange of IGOSS (now JCOMM) Data - IOC Manual and Guides No.3
3. IGOSS (now JCOMM) Plan and Implementation Programme - IOC Technical Series No. 43
4. Best Guide And Principles Manual For The Ships Of Opportunity Program (SOOP) and Expendable Bathythermograph (XBT) Operations
5. GO-SHIP Repeat Hydrography Manual
<http://www.go-ship.org/HydroMan.html>

2) NMS

1. Australia
 - a. Devil XBT User Manual

3. ASAP

a. WMO

1. No guidance available at this time.

b. EUCOS

1. No guidance available at this time.

c. Germany

1. ASAP-Manual for sounding procedures

d. Japan

1. Guide to Upper-Air Observation (JMA; in Japanese)

ANNEX B OF APPENDIX E

INSTRUMENT STANDARDS EQUIPMENT STATUS REPORT

A. VOS

a. Barometers

BAROMETERS				
National VOS	Barometer	Barometer Type	Barometer Setting	Type of Correction Tables Used
Australia	Vaisala PTB220	Digital	Station Level	Height
Australia		Precision Aneroid	Station Level	Pressure/Temperature, Drift & Height
Croatia	Barigo Fisher SUNDO	Ship's Aneroid Ship's Aneroid Ship's Aneroid	MSL MSL MSL	NIL NIL NIL
Ecuador		Aneroid	MSL	NIL
France	Vaisala PTB220	Digital	Station Level	Height
Germany	Fuess Vaisala PTB330	15PM Digital	MSL MSL	NIL NIL
Greece	Belfort	Aneroid	Station Level	Height / Temperature
Hong Kong	Hisamatsu OTA	Precision Aneroid Precision Aneroid Ship's Aneroid	MSL MSL MSL	U.K. Met. O. 740 U.K. Met. O. 740 U.K. Met. O. 740
Iceland	Fuess Vaisala PA11	Ship's Aneroid Digital	MSL MSL	Air Pressure Dependent
Ireland		Ship's Aneroid Aneroid	MSL MSL	NIL NIL
Japan		Aneroid Digital	Station Level Station Level	Pressure/Temperature Height Pressure/Temperature Height
Netherlands	Fuess Vaisala PTB220 Vaisala PTB330	Aneroid Digital Digital	Station Level Station Level Station Level	NIL NIL NIL
New Zealand	Fuess Vaisala PTB330	Aneroid Precision Aneroid Digital	MSL Station Level Station Level	NIL Instrument & Height Height
Norway	Vaisala PTB220	Digital	MSL	NIL
Singapore	PAB MK2 M2236		MSL	U.K. Met. O. 740
South Africa	Fuess	Aneroid	MSL	NIL
Sweden	Vaisala PTB220	Digital	Station Level	Height or TurboWin
United Kingdom	Negretti & Zambra PAB MK2 Vaisala PTB220 Vaisala PTB330	Precision Aneroid Barometer Digital Digital	Station Level	NIL
United States	Belfort Meteograf	Aneroid Digital	MSL MSL	NIL NIL

NOTES: 1) For Ships using TurboWin, the Height correction is applied by the software.
2) Information can also be found on VOS web site at:
http://www.bom.gov.au/jcomm/vos/national_practices_pressure.html

b. Barographs

BAROGRAPHS			
National VOS	Barograph	Barograph Type	Barograph Setting
Australia		Open Scale	Station Level
Croatia	KOMPAS	Open Scale	MSL
Ecuador		Micro-Barograph	MSL
France	None		
Germany	Mueller 78A Lambrecht 290 Vaisala PTB330	Small Scale Small Scale Digital	MSL MSL MSL
Greece	Belfort	Open Scale (4 Day)	Station Level
Hong Kong	Fischer Sato Hisamatsu Isuzu Seisakusho OTA	Small Scale Small Scale Small Scale Small Scale Small Scale	MSL MSL MSL MSL MSL
Iceland	None		
Ireland		Open Scale (7 Day)	MSL
Japan		Open Scale (1 Day) Open Scale (7 Day)	Station Level Station Level
Netherlands	Fuess Vaisala PTB220 Vaisala PTB330	Aneroid Digital Digital	Station Level Station Level Station Level
New Zealand	Vaisala PTB330	Open Scale Digital Display	MSL Station Level
Norway	Vaisala PTB220	Digital Display	MSL
Singapore		Open Scale MK3	MSL
South Africa	Mason		MSL
United Kingdom	Negretti & Zambra Fischer	Open Scale (7 Day) Open Scale (7 Day)	MSL MSL
United States	Belfort DBX1 Meteograf	Open Scale (4 Day) Digital Digital (1 year)	MSL MSL MSL

c. Transfer Standard Barometers

VOS Transfer Standard Barometers		
National VOS	Barometer	Frequency of Barometer comparison
Australia	Vaisala PTB220B	4 monthly
Equador	OACI mercury	6 monthly
France	None	
Germany	Vaisala PTB330 Druck DPI 740	6 monthly 6 monthly
Greece	Belfort Aneroid	3 - 6 monthly
Hong Kong, China	Digital Aneroid Barometer	9 monthly
Japan	Vaisala Digital Barometer Paroscientific	6 monthly
New Zealand	Vaisala PTB220AD	12 monthly
Norway	Digiquartz	12 monthly
South Africa	Vaisala PA11 & Precision Aneroid	3 - 6 monthly
Sweden	Vaisala PA11A	12 monthly
United Kingdom	Precision Aneroid Barometer Vaisala PTB330TS (also includes temp/humidity output to handheld device)	6 monthly 6 – 12 monthly
United States	Digiquartz	6 monthly

d. Thermometers

VOS THERMOMETER TYPES and SETTINGS			
National VOS	Thermometer	Thermometer Type	Thermometer Fluid
Australia	AMA	Liquid-in-glass	Hg
Germany	Sling Eigenbrodt Rotronic Hygropalm	Liquid-in-glass Digital	Hg
Greece	Schneider	Liquid-in-glass	Hg
France	Vaisala HMP34	Digital	
Netherlands	Schneider	Liquid-in-glass	Alcohol
Norway	PT100		
Sweden	PT100		
United Kingdom	Zeal 2C AMA	Liquid-in-glass Liquid-in-glass	Hg Hg
United States	Zeal P2505	Mason Hygrometer	Glycol

e. Sea Surface Temperature

VOS SEA SURFACE TEMPERATURE TYPES and SETTINGS			
National VOS	Sensor	Sensor Type	Sensor Scale C/F
Australia	Sea thermometer	Ship's intake Bucket (UK)	C C
Germany	Sea thermometer	Bucket Ship's intake Hull contact sensor	C C C
Greece	Sea thermometer	Ship's intake	C
Netherlands	Sea thermometer	Ship's intake Bucket (alcohol or mercury)	C
Norway	Sea thermometer	Hull contact	C
United Kingdom	Sea thermometer	Bucket Ship's intake Hull contact sensor	C C C
United States		Ship's Intake	Either (ship Dependent)

f. Automated Systems

VOS AUTOMATED SYSTEMS			
National VOS	Type of AWS (as of 31/12/2008)	Communication Method	Manual Entry Facility
Australia	Vaisala Milos 500 AWS	Inmarsat C (Data Mode)	Yes
Canada	AVOS – AXYS Technologies	Inmarsat C Iridium	Yes
EUMETNET	BATOS	Inmarsat C (Data Mode) & Iridium SBD	Yes
	BAROS	Iridium SBD	No
France	BATOS	Inmarsat C (Data Mode) & Iridium SBD	Yes
	MINOS MERCURY	Argos Iridium SBD	No Yes
Germany	Vaisala Milos 500 AWS Ship's own datalogger SCAWS	eMail / Meteosat Inmarsat / Iridium eMail	Some Yes No
Ireland	Vaisala Milos AWS	Meteosat	No
Japan	Koshin Denki Kogyo Co., Ltd (Japan)	MTSAT & Inmarsat C	Some
	Nippon Electric Instrument Inc. (Japan)	Inmarsat C	Some
	Brookhaven National Laboratory (USA)	Inmarsat C	Yes
New Zealand	Sutron 9000RTU	MTSAT	Yes
	mSTAR-SHIP	GPRS Cell	No
Norway	PC with QLC50	VSAT with Iridium	Yes
Russia	GM6	Inmarsat C	Yes
South Africa	Vaisala Milos 520	Inmarsat C	Yes
Spain	Vaisala Milos	Inmarsat C	Yes
United Kingdom	MINOS-GP	Argos	No
	MINOS-GPW	Argos	No
	BATOS	Inmarsat C (Data Mode)	Yes
	AMOS	Iridium	No
United States	SEAS-Autolmet	SEAS	Some
	Ship's own datalogger	eMail	No

B. SOOP

i. Expendable BathyThermograph (XBT)

XBT Probe	
National SOOP	Equipment Type
Australia	Sippican
France	Sippican (Deep Blue, T7 and Fast Deep)
United States	Sippican (DeepBlue and FastDeep)

ii. XBT Recorder System

XBT Recorder	
National SOOP	Equipment Type
Australia- BOM	Devil XBT
Australia- CSIRO	Devil XBT
France	Devil XBT Sippican MK21 USB (DAQ)
United States	Sippican MK21 ISA Sippican MK21 USB (DAQ)

iii. XBT Launcher System

XBT Launcher	
National SOOP	Equipment Type
France	Sippican Hand Launcher AOML Autolauncher
United States	Sippican Hand Launcher (LMA3) AOML Autolauncher (AOML) Scripps Autolauncher (SIO)

iv. XBT Transmission System

XBT Transmission	
National SOOP	Equipment Type
France	Argos
United States	T&T Sailor 403026S Mini-C transceiver Iridium NAL SAF4070-IG Iridium NAL A3LA-XG Furuno GPS Navigator GP-32

v. ThermoSalinoGraph (TSG)

Thermosalinograph (TSG)	
National SOOP	Equipment Type
France	Seabird 21 TSG
United States	Seabird 21 TSG Seabird 38 Remote Temperature Sensor Seabird 45 MicroTSG

vi. TSG Transmission System

TSG Transmission	
National SOOP	Equipment Type
France	Inmarsat C
United States	Iridium Antenna / Modem

vii. Conductivity, Temperature, and Depth (CTD)

Conductivity, Temperature, and Depth (CTD)	
National SOOP	Equipment Type
United States	Seabird 19 Seabird 25 Seabird 911+

viii. Expandable Conductivity, Temperature, and Depth (XCTD)

Expandable Conductivity, Temperature, and Depth (XCTD)	
National SOOP	Equipment Type
United States	Sippican TSK

ix. Acoustic Doppler Current Profile (ADCP)

Acoustic Doppler Current Profile (ADCP)	
National SOOP	Equipment Type
United States	RD Instruments

x. Partial Pressure of CO₂ (pCO₂)

Partial Pressure of CO₂ (pCO₂)	
National SOOP	Equipment Type
Australia	CSIRO
France	Craig Neill / GO 8050 system
United States	General Oceanics

xi. Moving Vessel Profiler

Moving Vessel Profiler	
National SOOP	Equipment Type
United States	Brooke
United States	Scripps

C. ASAP

ASAP TYPES and COMMUNICATIONS				
National ASAP	Container	Sounding Equipment	SATELLITE TRANSCEIVER	
E-ASAP	Denmark	10ft container Built-In launcher 10ft container	Vaisala MW41 Vaisala MW41 GRAW GS-E	Iridium Sailor SC4000 Iridium Sailor SC4000 Iridium Sailor SC4000
	E-ASAP	10ft container 10ft container 10ft container 10ft container 10ft container 10ft container	Vaisala MW31 Vaisala MW31 Vaisala MW31 Vaisala MW31 Vaisala MW31 Vaisala MW31	Iridium Sailor SC4000 Iridium Sailor SC4000 Iridium Sailor SC4000 Iridium Sailor SC4000 Iridium Sailor SC4000 Iridium Sailor SC4000
	France	Deck launcher Deck launcher Deck launcher Deck launcher	MODEM SR2K MODEM SR2K MODEM SR2K MODEM SR2K	Iridium Sailor SC4000 Iridium Sailor SC4000 Iridium Sailor SC4000 Iridium Sailor SC4000
	Germany	Decklauncher 20ft container Deck launcher Deck launcher	Graw GS-E Graw GS-E Graw GS-E Graw GS-E	Iridium Sailor SC4000 Iridium Sailor SC4000 Iridium Sailor SC4000 Iridium Sailor SC4000
	Spain	10ft Container	Vaisala MW21	Iridium Sailor SC4000
	Japan	10ft Container	MW11	MTSAT & Inmarsat-C

ANNEX C OF APPENDIX E
STATUS OF ACTIONS AGREED AT SOT-7

Reference: SOT-7 final report, Appendix A Part One

No	Ref	Action item	Status
2	3.1.4.3(c)	The TT-IS to complete the production of a JCOMM Technical Report to include guidelines on standards for instruments (including a list of related WMO, UNESCO/IOC, and national publications for each of the SOT programme components) and high quality best practices for the Voluntary Observing Fleet (VOF) and the Ship Of Opportunity Programme (SOOP)	Agreed to produce a webpage listing relevant existing documentation, and to keep it updated as needed. Final decision of actual website pending.
4	3.1.4.4(b)	Continued review of relevant chapters of the WMO Publications No. 8, No. 471, and No. 488	Review of WMO No. 8 underway per action item No. 118 Ongoing, but no discussion since last SOT.
12	6.5.3	TT-IS to continue to collect information from AWS systems used by SOT members in the view to have sufficient materials to eventually perform the intercomparison and be able draw significant conclusions from the available information	Closed; not realistic.
19	10.2.1(1)	to legacy recommendation 2, the Team agreed to contribute to the review of WMO and IOC Publications through its Task Team on Instrument Standards, and other Task Teams as appropriate	David Meldrum working on the Publications and consulting with OPA Panels. Published as "A review of selected WMO and IOC Publications relating to marine Observations" WM OSSA ref 1768-11 October 2013
20	10.2.7	The SOT requested the TT-IS, in liaison with other Task Teams as appropriate, and in a way consistent with the strategy proposed by the JCOMM Pilot Project for WIGOS, to participate in the efforts to further update the above publications as well as IOC M&G No. 4 & 26, WMO No. 544 & 488	Ongoing, but no discussion since last SOT.

Reference: SOT-7 final report, Appendix B

No	Ref	Action item	Status
10	5.2.2.7	To identify and define a set of standard quality control procedures for underway thermosalinograph (and additional flow through sensor) data	Ongoing? Maybe more effective when transferred to SOOP chair?
55	6.5.6(ii)	To complete the new JCOMM TR No. 63, Recommended Algorithms for the computation of marine meteorological variables	Done Further variables shall be handled in the next intersessional period.
56	6.5.6(iii)	To complete the review of relevant sections of the WMO No. 8 Guide, and to submit those changes to CIMO as needed	Done
126	9.2.1.11	To look at the issue of preserving AWS data, and to make recommendations in this regard at the next SOT Session	No longer required, can be closed.

ANNEX D OF APPENDIX E

ADDITIONAL INFORMATION TO APPENDIX C

No 2

As agreed during SOT-7 a webpage shall be produced to list relevant existing documentation. The TT-IS requests a decision concerning where to publish that webpage. JCOMMOPS could be the appropriate context.

The TT-IS recommends to add tools such as online questionnaires to this website allowing to collect and provide relevant information, such as guidelines and instruments used.

No 55

The TR 63 has been published:

http://www.icomm.info/index.php?option=com_oe&task=viewDocumentRecord&docID=14669

The TT-IS recommends to add further variables to the TR and seeks guidance on variables to be included during the next intersessional period.

APPENDIX F

REPORT BY THE TASK TEAM ON CALL SIGN MASKING AND ENCODING (TT-MASKING)

(report submitted by the Chair of the Task Team, Mr Graeme Ball – Australia)

1) Task Team members

Graeme BALL (Australia), TT Chair	Chris MARSHALL (Canada)
Sarah NORTH (United Kingdom)	Lily Fung (Canada) – added during the inter-sessional period
David BERRY (United Kingdom)	Colin PARRETT (United Kingdom)
Etienne CHARPENTIER (WMO Secretariat)	Scott WOODRUFF (United States)
Martin KRAMP (Ship Coordinator)	

2) The Task Team addressed its Terms of Reference as detailed below.

ToR no.	Terms of Reference	Action(s) undertaken during the intersessional period
1	Oversee the implementation of MASK ¹² , SHIP ¹³ and ENCODE ¹⁴ and develop guidelines as necessary;	Ongoing activity. An advice was distributed to the mailing lists reminding members that the use of any NMS-generated callsign must be approved by the TT.
2	Review and approve national MASK schemes to ensure they remain unique and do not impinge on (1) the ITU callsign series allocated to a country, or (2) any other marine or oceanographic identification scheme used by WMO, e.g. buoy identification numbers;	Ongoing activity. The TT reviewed an E-SURFMAR proposal to use generic callsigns, i.e. MASK to identify ships fitted with particular instrumentation. It was recommended that 4 of 6 requests be approved. The two remaining callsign sequences were both in conflict with the official ITU list. A list of alternative callsign sequences (MASK) approved by TT-Masking is at Annex 1.
3	Ensure the MASK v REAL ¹⁵ database is kept up-to-date by NMSs implementing MASK ;	E-SURFMAR provides a facility to maintain MASK details of all ships in the VOS Metadata Database and Members using this database operationally are urged to maintain the details in this manner. Other Members are requested to provide JCOMMOPS with a monthly list of ships using MASK as per the SOT instruction for implementing a MASK Callsign Scheme.
4	Develop the ENCODE encryption strategy, as well as develop the encoding and decoding keys.	Ongoing activity. BUFR Table B descriptors and Table D sequence for the reporting of an Encrypted Ship's call sign and encryption method were proposed to the WMO IPET-DRMM. These were subsequently accepted for validation

12: MASK - Unique, repeating identifier. The masking identifier is assigned by the NMS that recruited the ship.

13: SHIP: Letters "SHIP" used in place of the real ship identifier.

14: ENCODE - Unique, non-repeating identifier. The identifier is derived from encrypting elements in the message, e.g. callsign + latitude + longitude.

15: REAL - Official ITU callsign of the ship.

		<p>(see SOT-8 / Doc 10.3). Proposals for the “Security requirements for the encryption / decryption of ship’s call sign” were made by the UKMO, reviewed by TT-MASKING and TT-TDC and subsequently approved by the JCOMM co-presidents (Annexes 2 and 3). It is proposed to establish a JCOMM Focal Point on Ship Masking for the management of the encryption / decryption keys(see draft Terms of Reference in Annex 4), and someone nominated to undertake that role . The BUFR Table D sequence and Table B descriptors need to be validated (see SOT-8 / Doc 10.3).</p>
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3) Recommendations of the Task Team to SOT-8

- (1) The Task Team recommends the following change to its membership:
Remove: Graeme Ball (Australia) as member and Chair of TT
- (2) In line with recommendation 1, the TT shall appoint a new Chair.
- (3) The Task Team recommends that Members using the E-SURFMAR VOS Metadata Database operationally, continue to maintain their **MASK** details as an alternative to submitting a quarterly advice to JCOMMOPS.
- (4) The Task Team further recommends that E_SURFMAR continue to provide JCOMMOPS with a list of current **MASK** details on a daily basis.
- (5) To establish a JCOMM Focal Point on Ship Masking, which draft Terms of Reference are provided in Annex 4. In particular, the Focal Point shall be responsible for managing encryption / decryption keys.
- (6) The SOT Chair to submit the draft Terms of Reference of the JCOMM Focal Point on Ship Masking to the JCOMM Co-Presidents for their approval.
- (7) Once approved, the Chair of the Task Team should nominate someone to become the new Focal Point on Ship Masking and submit the proposal to the JCOMM Co-Presidents for their approval.

Annexes:

- Annex 1** List of alternative callsign sequences (i.e. MASK) approved by SOT TT-Masking
 - Annex 2** Decision of the JCOMM Co-Presidents regarding Security requirements for the encryption/decryption of ship’s call signs within BUFR reports distributed on GTS
 - Annex 3** Security requirements for the encryption/decryption of ship’s call sign
 - Annex 4** Proposed draft Terms of Reference of the JCOMM Focal Point on ship masking
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Annex 1 (of Appendix F)

LIST OF ALTERNATIVE CALLSIGN SEQUENCES (I.E. MASK) APPROVED BY SOT TT-MASKING

where \$\$ is replaced by the appropriate 2 letter ISO country code

SEQUENCE		SEQUENCE ALLOCATED TO	CONTACT		COMMENT
Start	End				
AMO\$\$00	AMO\$\$99	UKMO	Sarah North	sarah.north@metoffice.gov.uk	
BAT\$\$00	BAT\$\$99	E-SURFMAR	Pierre Blouch	Pierre.Blouch@meteo.fr	
BAR\$\$00	BAR\$\$99	E-SURFMAR	Pierre Blouch	Pierre.Blouch@meteo.fr	
MIN\$\$00	MIN\$\$99	E-SURFMAR	Pierre Blouch	Pierre.Blouch@meteo.fr	
MIL\$\$00	MIL\$\$99	E-SURFMAR	Pierre Blouch	Pierre.Blouch@meteo.fr	
TBW\$\$00	TBW\$\$99	E-SURFMAR	Pierre Blouch	Pierre.Blouch@meteo.fr	
AVO\$\$00	AVO\$\$99	E-SURFMAR	Pierre Blouch	Pierre.Blouch@meteo.fr	
IDD\$\$00	IDD\$\$99	E-SURFMAR	Pierre Blouch	Pierre.Blouch@meteo.fr	
MER\$\$00	MER\$\$99	E-SURFMAR	Pierre Blouch	Pierre.Blouch@meteo.fr	
OSC\$\$00	OSC\$\$99	E-SURFMAR	Pierre Blouch	Pierre.Blouch@meteo.fr	
SCA\$\$00	SCA\$\$99	E-SURFMAR	Pierre Blouch	Pierre.Blouch@meteo.fr	

AS\$\$00	AS\$\$99	E-ASAP	Rudolf Krockeur	Rudolf.Krockauer@dwd.de	
KS000	KS999	SeaKeepers	Geoff Morrison	morrison@seakeepers.org	
KS0000	KS9999	SeaKeepers	Geoff Morrison	morrison@seakeepers.org	
B2K0000	B2K9999	Korea Meteorological Administration	Ji-Eun	marsram@korea.kr	
B2M0000	B2M9999	Australian Bureau of Meteorology	Graeme Ball	marine_obs@bom.gov.au	
B3M0000	B3M9999	Australian Bureau of Meteorology	Graeme Ball	marine_obs@bom.gov.au	
B4M0000	B3M9999	Australian Bureau of Meteorology	Graeme Ball	marine_obs@bom.gov.au	
B5M0000	B3M9999	Australian Bureau of Meteorology	Graeme Ball	marine_obs@bom.gov.au	
B6M0000	B3M9999	Australian Bureau of Meteorology	Graeme Ball	marine_obs@bom.gov.au	
B7M0000	B3M9999	Australian Bureau of Meteorology	Graeme Ball	marine_obs@bom.gov.au	
B8M0000	B3M9999	Australian Bureau of Meteorology	Graeme Ball	marine_obs@bom.gov.au	
B9M0000	B9M9999	Australian Bureau of Meteorology	Graeme Ball	marine_obs@bom.gov.au	
M2M0000	M2M9999	SAMOS	Shawn Smith	smith@coaps.fsu.edu	Provisional
N8Z0000	N8Z9999	Met Service New Zealand	Ross Bannister	marine@metervice.com	

Current as at 1 March 2015

Annex 2 (of Appendix F)
DECISION OF THE JCOMM CO-PRESIDENTS REGARDING SECURITY REQUIREMENTS FOR
THE ENCRYPTION/DECRYPTION OF SHIP'S CALL SIGNS WITHIN BUFR REPORTS
DISTRIBUTED ON GTS



INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION
COMMISSION OcéANOGRAPHIQUE INTERGOUVERNEMENTALE
COMISIÓN OCEANOGRÁFICA INTERGUBERNAMENTAL
МЕЖПРАВИТЕЛЬСТВЕННАЯ ОКЕАНОГРАФИЧЕСКАЯ КОМИССИЯ



WORLD METEOROLOGICAL ORGANIZATION
ORGANISATION MÉTÉOROLOGIQUE MONDIALE
ORGANIZACIÓN METEOROLÓGICA MUNDIAL
ВСЕМИРНАЯ МЕТЕОРОЛОГИЧЕСКАЯ ОРГАНИЗАЦИЯ

JOINT WMO/IOC TECHNICAL COMMISSION FOR OCEANOGRAPHY
AND MARINE METEOROLOGY (JCOMM)

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Subject: Security requirements for the encryption/decryption of ship's call signs within BUFR reports distributed on GTS.

TO WHOM IT MAY CONCERN

We refer to the security requirements for the encryption/decryption of ship's call signs with reports distributed onto the Global Telecommunication System (GTS) and encoded in the FM-94 BUFR format. According to Resolution 27¹ (EC-59), Members may in consultation with ship owners implement on a trial basis a callsign masking scheme, as a process which would facilitate open distribution of masked data on the Global Telecommunication System.

Considering:

- (i) the Ship Callsign Masking: ENCODE Proposal (v7, July 2013) approved by the Ship Observations Team (SOT), and the JCOMM cross cutting Task Team on Table Driven Codes (TT-TDC);
- (ii) agreement for validation by the Commission for Basis Systems (CBS) Inter-Programme Expert Team on Data Representation Maintenance and Monitoring (IPET-DRMM) at its first meeting (Tokyo, Japan, 1-5 July 2013) concerning the revised proposal of JCOMM for the encryption of ship's identification in BUFR reports; and
- (iii) subsequent consultation with JCOMM experts regarding the security requirements associated to the revised proposal, and their resulting consensual agreement with regard to such requirements;

We approve the use on a trial basis of the Security Requirements for the Encryption/Decryption of Ship's call sign as proposed in the annex to this letter, and until further advice from the WMO Executive Council per Resolution 27 (EC-59).

Yours faithfully,

(Johan Stander)
Co-president, JCOMM

(Nadia Pinardi)
Co-president, JCOMM

1 <http://www.wmo.int/pages/prog/mmop/JCOMM/OPA/SOT/documents/Resolution27-EC59.pdf>

Annex 3 (of Appendix F)

SECURITY REQUIREMENTS FOR THE ENCRYPTION/DECRYPTION OF SHIP'S CALL SIGN

(Requirements initially proposed by Mr Richard Weedon of the UK Metoffice, and then reviewed by the SOT Task Team on Ship Masking¹⁶, and the JCOMM Task Team on Table Driven Codes¹⁷)

References –

SOT-7/DOC.6 Rev.3 (JCOMM Reports and Recommendations by the Task Teams - submitted 22nd April 2013)

Conditions for Encryption

Ship's call sign are encrypted within FM-94 BUFR (BUFR) reports distributed in real-time onto the Global Telecommunication System (GTS) whenever the country recruiting the ship decides so in order to protect the identity of the ship (the so called ENCODE scheme). The country recruiting a ship may also decide not to encrypt a call sign, and transmit either the real ship's call sign (the so called REAL scheme), or a unique identification number allocated to the ship by the recruiting country per the MASK scheme agreed upon by the Ship Observations Team (SOT) of JCOMM (see the WMO website 18 for details). These security requirements below only apply to encryption/decryption of the ship's callsign (ENCODE scheme).

Whenever the ENCODE scheme is used, only the ship's call sign will be encrypted (possibly using the date and time in the encryption routine so as to produce a unique non-repeating encrypted value).

Proposed Security Requirements -

1. The Organisation shall protect the ship's call sign for the duration of two years from the time of validity of the BUFR message containing this call sign.
2. To allow for the historical use of data, the Organisation shall protect the decryption keys for a period of at least 2 years (the recruiting country may wish to request for a specific decryption key to be protected for a longer period) from the time of validity of the last BUFR report using that key.
3. The Organisation shall use the decryption method and the decryption key(s) provided by the Secretary General of WMO.
4. The Organisation shall ensure that only authorised people within the organisation can have access to the decrypted BUFR messages containing the ship's call signs.
5. The Organisation shall only authorise people within the organisation to see the decrypted call signs where they have a genuine business or scientific need.
6. The Organisation shall only transmit the original BUFR messages (i.e. not the decrypted BUFR messages) to other organisations. See footnote 19.
7. The Organisation shall ensure that appropriate sanctions are in place for any transgression of the agreement between the Organisation and the authorised person within the Organisation.

16 http://www.jcomm.info/index.php?option=com_oe&task=viewGroupRecord&groupID=150

17 http://www.jcomm.info/index.php?option=com_oe&task=viewGroupRecord&groupID=199

18 http://www.wmo.int/pages/prog/amp/mmop/JCOMM/OPA/SOT/VOS_masking.html

19 From UKMO's perspective, the Organization means UK Met Office only. It does not include legitimate third party organizations such as NOC (i.e. National Oceanography Centre) or other NHMS. If such third party organizations require decrypted data, they must apply to the WMO Secretariat / JCOMM for the decryption key.

8. The Organisation shall report to the WMO Secretary General any incident that has resulted in an actual or potential breach of the secret information (i.e. reports containing the decrypted call sign and/or the decryption key(s)), and what action has been taken.

Governance

- The governance for the management of encryption methods and keys will be under the authority of the WMO Secretary General. The JCOMM will be responsible to make proposals at the technical level. Such proposals shall be submitted to the WMO Secretary General by the JCOMM Co-President(s).
 - The WMO Secretary General will authorize making the encryption key available to an Organisation after a formal confidentiality agreement has been signed by the Permanent Representative of that Organisation.
 - Any breach of the security requirements could result in the Organisation having the key(s) withdrawn.
-

Annex 4 (of Appendix F)

PROPOSED DRAFT TOR OF THE JCOMM FOCAL POINT ON SHIP MASKING

In order to be able to further proceed with the validation (and later with managing and operating the encryption system), it is proposed to establish a JCOMM focal point on ship masking with the following Terms of Reference.

The JCOMM Focal Point on Ship Masking shall:

- 1) Review ship masking requirements and maintain information about such requirements, and solutions proposed by Members;
- 2) Act as a focal point on ship masking issues, including providing Members (incl. ship operators, and GTS users) with information on the ship masking requirements, and collecting information from Members of possible problems and unauthorized use of masked data;
- 3) Keep the JCOMM Security requirements for the encryption/decryption of ship's call signs within BUFR reports distributed on GTS under review, suggest changes if necessary, and have them approved by JCOMM;
- 4) Create when needed, and record the private and public keys for the encryption/decryption of masked ship reports;
- 5) Make the public key available to the end users with no restriction;
- 6) Make the private key operationally available to the legitimate end users and request them to sign an agreement for not releasing the key to external users; and
- 7) Maintain a template for such agreement, and have it reviewed and endorsed by JCOMM.

APPENDIX G

REPORT BY THE TASK TEAM ON TRAINING

(report submitted by the Chair of the Task Team, Ms Paula Rychtar – USA)

1) Task Team members

- Paula RYCHTAR (United States)
- Graeme BALL (Australia)
- Francis BRINGAS (United States)
- Henry KLETA (Germany)
- Ben LEMON (Canada)
- Sarah NORTH (United Kingdom)
- Shawn RICKARD (Canada)

2) The Task Team addressed its Terms of Reference as detailed below.

ToR no.	Terms of Reference	Action(s) undertaken during the intersessional period
1	Develop global standards, practices and functions for Port Meteorological Officers	<p>-It was taken into account that there is a great need for standardization and best practices for port meteorological officers, worldwide. Expectations for this basic level of cooperation between countries and support to their global fleet should be common practice. The task team’s objective will be towards establishing global standards and best practices by providing proper training, guidance and producing readily available references/documentation/standard operating procedures (SOP) for Port Meteorological Officers. The last PMO international workshop was held in Orlando Florida, 2010. During the JCOMM SOT 7, 6.7.1 it was decided more effort was needed to insure best practices and standardization for PMOs, hence the establishment of new task teams; TT- Instrument standards and TT-Training.</p> <p>-In August of 2014, the U.S. VOS management team organized a PMOs workshop. Originally designed to focus on the U.S. PMOs with emphasis on internal program standardization, it was soon realized that because of our ever-increasing global interconnections, invitation to international SOT team members and data quality specialists would add value to this workshop’s purpose for developing global standards and best practices. The UK VOS program manager’s attendance at the workshop was instrumental in providing E-SURFMAR rationale, along with practical knowledge on best practices from JCOMMS SOT perspective. NCDC staff provided discussion and guidance on data quality (real time and delayed mode) as did a representative(s) from NOAA’s Ocean Prediction Center. AOML provided representation for SOOP and XBT instruction. Environment Canada provided representation and gave the Canadian AWS perspective. The workshop was three full days of interaction, break-out sessions which included user based discussion panels. The panels provided input from ships Captains on product, quality and service. The NWS VOS /PMO workshop agenda and power points can be found on the U.S. VOS website: http://www.vos.noaa.gov/met_officers_workshop.shtml</p> <p>It is the recommendation of the TT to utilize the structure and methods for the upcoming international PMO Workshop.</p> <p>-A huge effort towards developing global standards, practices and functions was the implementation of the e-logbook TurboWin for the U.S. VOS Fleet. In support of JCOMM SOT and the VOS program initiatives towards standard best practices, using compliant software which integrates the logic behind instrument standards and JCOMM Technical Report 63 on computation of marine meteorological variables is essential for data collection.</p>

		<p>- TurboWin software version 2.2 (Plus) gives the option to produce AMVER messages. It is with this new capability that the TT suggests training in its use and provide a basic understanding of why AMVER reporting could possibly encourage VOS participation in data sparse areas of the world.</p>
2	Maintain Reference Guides for PMOs and national VOS, SOOP and ASAP Program Managers	<p>Currently for VOS PMO and Managers: http://www.bom.gov.au/jcomm/vos/resources.html</p> <p>SOOP : See ToR 8</p> <p>Currently for ASAP, SOOP, VOS, and other supplementary programs and projects: http://www.bom.gov.au/jcomm/vos/projects.html</p>
3	Coordinate international PMO Training Workshops	<p>- An international PMO workshop on VOS automated weather sensors is being proposed for Hamburg Germany in 2016. Initial planning for this workshop would be to address this as an “E-PMO” workshop with hopes of inviting PMOs from outside E-SURFMAR. It is understood, that would first need to be coordinated with E-SURFMAR. The effort would benefit the PMOs overall understanding and improve the PMOs skill set. This would cover the mention in the executive summary from SOT 7; <i>Panel discussed the role of the PMO and PMO activities and inspections. In order to increase PMO awareness of different AWS system functionality, the Panel recommended to the Team that consideration should be given to convening an international Shipborne AWS Workshop during the next intercessional period.</i></p> <p>-WebEx training for PMOs on the use of the E-SURFMAR database should be organized (action; SOT 7, final document, 2.3 P. Blouch; end 2013). This action item needs to be revisited for action. I believe this training could be done during the 5th international PMO Workshop, tentatively planned for July 2015 in Chile.</p> <p>-5th International PMO Workshop, July 2015-Chile-Vina del Mar. This will be a five year lapse from the last international workshop that was held in Orlando Florida. It is the intention of the Training TT to offer webinars to provide ongoing instruction and reinforcement of best practices and global standardization between formal International Workshops. TT suggests that International Workshops should be organized every five years in order to maintain momentum in global consistency.</p> <p>-PMO Exchange programs-ongoing efforts</p>
4	Encourage the development of VOS programs in data-sparse areas	<p>-The PMO from the South Florida area is collaborating with the Europeans in developing the Tanzanian’s participating in the Drifter donation Program:</p> <p>Tanzania has successfully taken the first steps per http://www.wmo.int/pages/prog/amp/mmop/JCOMM/OPA/SOT/documents/DBC_P-SOT-Drifter-Donation-for-VOS.pdf</p> <p>The passenger catamarans which they intend to use unfortunately undertake only very short coastal voyages. See http://www.azammarine.com/ and http://www.azammarine.com/catamarans/</p> <p>The sorts of ships may have the advantage that they can be routinely visited, but being fast ferries they aren’t going to be ideal. It would be much more helpful internationally if they could target some of the larger ocean going vessels that visit Dar es Salam (see http://www.fleetmon.com/en/ports/Dar_es_Salaam_1392 and https://www.marinetraffic.com/en/ais/details/ports/2730/port:DAR_ES_SALAA M) and which undertake voyages through the data sparse Arabian Sea areas.</p> <p>Notwithstanding there is a political capacity building aspect that we should try to encourage -so even though these may be short voyages, it might be a first step</p>

		<p>towards developing their own national VOS capability. But the PEC urged caution: starting with one or two ferries at first to gauge the level of commitment, and asking them to consider a wider range of ocean going ships. (credits to Martin Kramp)</p> <p>-The Pacific Partnership Program continues.</p>
5	Encourage and promote the PMO Buddy Program to enhance the global PMO network	<p>-On going</p> <p>- PMOs continue to assist developing countries via email, encouraging participation in VOS. Emphasis on the following countries is ongoing: Guatemala and Chile, Bahamas, Gambia, Kenya and recently Tanzania, and Peru.</p>
6	Assist the TT-VRPP in the development of PMO resources	<p>-Mariners Weather Log, Currently is an international online magazine. This magazine is distributed three times a year; December, April and August. The MWL incorporates many PMO Resources and offers links to various websites which promote efforts of JCOMM SOT. This magazine resides (with all past issues) on the VOS Website: http://www.vos.noaa.gov/</p> <p>-TT would like to recommend that links to various international sites be offered in the MWL. Suggestions towards this would be welcome.</p> <p>-Recently "tip of the week" has been provided to National VOS Program Participants via email. This provides an excellent way of promoting best practices as well as encouraging feedback.</p>
7	Provide advice to Nautical Colleges about training syllabuses and assist with the training or the provision of training material	<p>-ON GOING</p> <p>-We maintain a working relationship and close links with all the major nautical colleges, worldwide. We provide advice and counseling to these nautical colleges in order to assist in the training efforts of the cadets. We supply and maintain a limited source of instrumentation at these colleges and training vessels for training the cadets. Presentations to the new entrants (when budget and time permits) is encouraged to be offered. It is highly beneficial for PMOs to accompany cadets on training voyages to assist in hands on observing techniques. The ability to provide this level of training is highly encouraged.</p> <p>It was suggested by the TT to insure that the IMO STCW Convention is current and investigate what is said specifically about training meteorology.</p> <p>http://www.imo.org/OurWork/HumanElement/TrainingCertification/Pages/STCW-Convention.aspx</p> <p>http://www.stcw.org/</p> <p>http://columbiapacificmaritime.com/STCW.html Table A-II/1 OICNW-1-7 A-C Specification of Minimum Standard of Competence, Officer in Charge of a navigational watch.</p> <p>http://www.uscg.mil/nmc/regulations/NVIC/NVIC_2014/nvic_12-14_oicnw_signed_28apr14.pdf</p>
8	Maintain User Manuals, Best Practices, and Reference Guides for ship riders collecting XBT data or performing drifter and Argo float deployments.	<p>http://www.aoml.noaa.gov/phod/goos/docs/index.php This web page include cruise plans for XBT transects, a brochure with information of the SOOP program, AOML XBT Auto-launcher SEAS2K Set-Up Instructions, AMVERSEAS Installation Guide, AutoIMET Installation Manual 2)</p> <p>http://www.aoml.noaa.gov/phod/goos/seas/amverseas_software.php The above link can be used to download AMVERSEAS. In addition, it contains the following Setup Manuals and User Guides: AMVERSEAS Installation Guide AMVERSEAS Setup Guide</p>

		<p>SEAS Console User Guide Buoy deployment instructions Marine Mammal Sighting User Guide SEAS TSG Data Recorder User Guide SEAS PC-Watchdog User Guide SEAS Met Observations Logger User Guide Sending observation via email SEAS AutoIMET Data Logger User Guide How to install and setup the SMTP mailer service How to generate a cruise report</p> <p>3) ftp://ftp.marine.csiro.au/software/devil/doc/Devil%20Manual.pdf CSIRO devil manual</p> <p>4) http://www.jcommops.org/soopip/publications.html XBT manuals, QC instructions</p> <p>5) http://www.argo.ucsd.edu/Argo_movies.html videos that describe how to deploy Argo floats</p> <p>6) http://www.adp.noaa.gov/how_to_deploy.html http://www.aoml.noaa.gov/phod/dac/Training_CD.pdf http://www.jcommops.org/dbcp/deployments/techniques.html http://www.jcommops.org/DBCP/doc/buoyDeployments/SAWS/SAWS_deployment.pdf http://esurfmar.meteo.fr/doc/o/db/others/Metocean_b_en_02.pdf Drifter deployment information and instructions</p>
9	<p>Maintain a website with relevant training documents.</p>	<p>-Currently, various websites hold relevant training documents</p> <p>-The TT suggests a migration of all training materials and references offering standard best practices to one centralized location;</p> <p>http://www.jcommops.org/sot/</p> <p>-Marine Observer's Handbook (UK) (included in TurboWin software) has become dated. The last edition (11th) was published in 1995. The NWS Observing Handbook No. 1 (US) was last published in 2010; this handbook has also become quite dated.</p> <p>http://www.metoffice.gov.uk/archive/marine-observers-handbook-11th-edition</p> <p>http://www.vos.noaa.gov/ObsHB-508/ObservingHandbook1_2010_508_compliant.pdf</p>

3) Recommendations of the Task Team to SOT-8

(i) Develop global standards, practices and functions for Port Meteorological Officers

PMO exchange program-The primary deliverable from PMO-V is the initiation of PMO exchange program between countries. This would provide an extraordinary opportunity to broaden the experience, techniques and appreciate as well as provide a different perspective in VOS support strategies.

(ii) Recommendation that the following changes be made to the membership of the Task Team:

Remove: Graeme Ball (Australia)
Add: Joel Cabrie' (Australia)

(iii) Action Item(s) ToR 7:

- c. Ensure that the IMO STCW²⁰ Convention is current and investigate what is specifically mentioned and required about training meteorology. Ensure that training syllabuses are based on the IMO STCW Convention. It would be beneficial to obtain the various academies/colleges syllabuses used in training their cadets in preparation for developing power point presentations. These power points should cover a) detailing PMO activities and the service they provide to the observing ships and b)an overview of SOT VOS and other observing practices (XBT, SOOP, ASAP).
- d. Now that TurboWin is the primary tool for compiling weather reports, the TT recommends that copies of TurboWin e-logbook software and user manual/handbooks are distributed to the various maritime colleges/academies, and in the best case given instruction on its use.

(iv) Action item ToR 9:

- e. TT recommends that the Marine Observers Handbook and the NWS Handbook No. 1, be revised and edited to include updates. The TT also suggests that a sub-committee be formed to accomplish this revision.

20 <http://www.imo.org/OurWork/HumanElement/TrainingCertification/Pages/STCW-Convention.aspx>